



# SEQUENCE LISTING

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<120> Recombinant Immunogens for the Generation of Antivenoms to the  
Venom of Scorpions of the Genus Centruroides

<130> 2399.0070001/JAG/LAV

<140> 10/721,793

<141> 2003-11-26

<150> US 60/430,067

<151> 2002-12-02

<160> 294

<170> PatentIn version 3.1

<210> 1

<211> 299

<212> DNA

<213> Centruroides exilicauda

<220>

<221> CDS

<222> (4)..(264)

<223> Product= Sodium channel modifier toxin precursor  
In the mature peptide, the last Cys is amidated, and the last Gly  
and the last 2 basic aminoacids are cut

<220>

<221> 5'UTR

<222> (1)..(3)

<223> 5'UTR

<220>

<221> mat\_peptide

<222> (61)..()

<223> Product= Sodium channel modifier toxin

<220>

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<222> (4)..(60)

<223> sig\_peptide

<220>

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<222> (268)..(299)

<223> 3'UTR

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aca	gtg	tgg	gca	aag	gaa	ggg	tat	ctg	gta	agc	aag	agc	acg	ggc	tgc	96		
Thr	Val	Trp	Ala	Lys	Glu	Gly	Tyr	Leu	Val	Ser	Lys	Ser	Thr	Gly	Cys			
				-1	1					5					10			
aaa	tac	gag	tgc	ttt	tgg	ttg	gga	aaa	aac	gaa	ggc	tgc	gat	aag	gaa	144		
Lys	Tyr	Glu	Cys	Phe	Trp	Leu	Gly	Lys	Asn	Glu	Gly	Cys	Asp	Lys	Glu			
				15					20					25				
tgc	aaa	gcg	ccg	aac	caa	gga	ggg	ggg	tac	ggc	tat	tgc	cac	gct	ttc	192		
Cys	Lys	Ala	Pro	Asn	Gln	Gly	Gly	Gly	Tyr	Gly	Tyr	Cys	His	Ala	Phe			
				30					35					40				
gca	tgc	tgg	tgc	gaa	aat	ttg	ccc	gaa	agt	aca	ccg	act	tat	ccc	att	240		
Ala	Cys	Trp	Cys	Glu	Asn	Leu	Pro	Glu	Ser	Thr	Pro	Thr	Tyr	Pro	Ile			
				45					50					55	60			
cct	ggg	aat	gaa	aac	gac	ttt	tta	ttgtccacca	acagaaatat				tgtaacgctt			294		
Pro	Gly	Asn	Glu	Asn	Asp	Phe	Leu											
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cttaa																299		

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<210> 2
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<400> 2
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Val Trp Ala Lys Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys  
-1 1 5 10

Tyr Glu Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys  
15 20 25

Lys Ala Pro Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala  
30 35 40 45

Cys Trp Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro  
50 55 60

Gly Asn Glu Asn Asp Phe Leu  
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<210>	3
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<213> Centruroides exilicauda

<220>

<221> CDS

<222> (1)..(195)

<223> Product= Sodium channel modifier toxin

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Lys Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu Cys	
1 5 10 15	

ttt tgg ttg gga aaa aac gaa ggc tgc gat aag gaa tgc aaa gcg ccg	96
Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Pro	
20 25 30	

aac caa gga ggt ggt tac ggc tat tgc cac gct ttc gca tgc tgg tgc	144
Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys	
35 40 45	

gaa aat ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa tca	192
Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser	
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tgc	195
Cys	
65	

<210> 4

<211> 65

<212> PRT

<213> Centruroides exilicauda

<400> 4

Lys Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu Cys	
1 5 10 15	

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20 25 30	

Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys	
35 40 45	

Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser	
50 55 60	

Cys	
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<210> 5

<211> 317

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<212> DNA
<213> Centruroides exilicauda

<220>
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<222> (4)..(264)
<223> Product= Sodium channel modifier toxin precursor
      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

<220>
<221> 3'UTR
<222> (268)..(317)
<223> 3'UTR

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<222> (61)..()
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<220>
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<222> (4)..(60)
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                -15                -10                -5

aca gtg tgg gca aag gaa ggt tat ctg gta agc aag agc acg ggc tgc      96
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys
      -1  1                5                10

aaa tac gag tgc ttt tgg ttg gga aaa aac gaa ggc tgc gat aag gaa      144
Lys Tyr Glu Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu
      15                20                25

tgc aaa gcg ccg aac caa gga ggt ggt tac ggc tat tgc cac gct ttc      192
Cys Lys Ala Pro Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe
      30                35                40

gca tgc tgg tgc gaa aat ttg ccc gaa agt aca ccg act tat ccc att      240
Ala Cys Trp Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile
      45                50                55                60

cct ggt aaa tca tgc ggc aaa aaa taatgaaaac gacttttttat tgtccaccaa      294
Pro Gly Lys Ser Cys Gly Lys Lys
                65

cagaaatatt gtaacgcttc taa      317

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<210> 6  
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 <212> PRT  
 <213> Centruroides exilicauda

<400> 6

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Ile Gly Thr  
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Val Trp Ala Lys Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys  
           -1  1                    5                    10

Tyr Glu Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys  
       15                    20                    25

Lys Ala Pro Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala  
   30                    35                    40                    45

Cys Trp Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro  
                     50                    55                    60

Gly Lys Ser Cys Gly Lys Lys  
                     65

<210> 7  
 <211> 195  
 <212> DNA  
 <213> Centruroides exilicauda

<220>  
 <221> CDS  
 <222> (1)..(195)  
 <223> Product= Sodium channel modifier toxin

<400> 7  
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 Lys Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu Cys  
 1                    5                    10                    15  
 ttt tgg ttg gga aaa aac gaa ggc tgc gat aag gaa tgc aaa gcg ccg 96  
 Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Pro  
                     20                    25                    30  
 aac caa gga ggt ggt tac ggc tat tgc cac gct ttc gca tgc tgg tgc 144  
 Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys  
                     35                    40                    45  
 gaa aat ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa tca 192  
 Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser  
       50                    55                    60

tgc  
Cys  
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<210> 8  
<211> 65  
<212> PRT  
<213> Centruroides exilicauda  
  
<400> 8

Lys Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu Cys  
1 5 10 15

Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Pro  
20 25 30

Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys  
35 40 45

Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser  
50 55 60

Cys  
65

<210> 9  
<211> 313  
<212> DNA  
<213> Centruroides exilicauda

<220>  
<221> CDS  
<222> (4)..(255)  
<223> Product= Sodium channel modifier toxin precursor  
In the mature peptide, the last 2 basic aminoacids are cut

<220>  
<221> 3'UTR  
<222> (259)..(313)  
<223> 3'UTR

<220>  
<221> sig\_peptide  
<222> (4)..(60)  
<223> sig\_peptide

<220>  
<221> mat\_peptide  
<222> (61)..()  
<223> Product= Sodium channel modifier toxin

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-15 -10 -5

acc gtg tgg gca aac gat ggt tat ttg ttt gac aag aga aag cgc tgc 96  
Thr Val Trp Ala Asn Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys  
-1 1 5 10

aca ctc gaa tgc ata gac aag aca gga gac aaa aat tgc gat aga aat 144  
Thr Leu Glu Cys Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn  
15 20 25

tgc aag aag gaa gga ggt agt ttt ggc aaa tgc tct tat tct gca tgc 192  
Cys Lys Lys Glu Gly Gly Ser Phe Gly Lys Cys Ser Tyr Ser Ala Cys  
30 35 40

tgg tgc aaa gga ttg ccc gga att aca ccg att tca cgt act cct ggt 240  
Trp Cys Lys Gly Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly  
45 50 55 60

aaa aca tgt aga aaa taatggcaac ttgtttttat tgtgcaccaa cagaaatatt 295  
Lys Thr Cys Arg Lys  
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gtaacgcttc ttaattgc 313

<210> 10  
<211> 84  
<212> PRT  
<213> Centruroides exilicauda

<400> 10  
Met Asn Ser Leu Leu Met Ile Thr Thr Cys Leu Ile Leu Val Gly Thr  
-15 -10 -5

Val Trp Ala Asn Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys Thr  
-1 1 5 10

Leu Glu Cys Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys  
15 20 25

Lys Lys Glu Gly Gly Ser Phe Gly Lys Cys Ser Tyr Ser Ala Cys Trp  
30 35 40 45

Cys Lys Gly Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys  
50 55 60

Thr Cys Arg Lys  
65

<210> 11  
 <211> 189  
 <212> DNA  
 <213> Centruroides exilicauda

<220>  
 <221> CDS  
 <222> (1)..(189)  
 <223> Product= Sodium channel modifier toxin

<400> 11  
 aac gat ggt tat ttg ttt gac aag aga aag cgc tgc aca ctc gaa tgc 48  
 Asn Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys Thr Leu Glu Cys  
 1 5 10 15  
 ata gac aag aca gga gac aaa aat tgc gat aga aat tgc aag aag gaa 96  
 Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys Lys Lys Glu  
 20 25 30  
 gga ggt agt ttt ggc aaa tgc tct tat tct gca tgc tgg tgc aaa gga 144  
 Gly Gly Ser Phe Gly Lys Cys Ser Tyr Ser Ala Cys Trp Cys Lys Gly  
 35 40 45  
 ttg ccc gga att aca ccg att tca cgt act cct ggt aaa aca tgt 189  
 Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys Thr Cys  
 50 55 60

<210> 12  
 <211> 63  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 12  
 Asn Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys Thr Leu Glu Cys  
 1 5 10 15  
 Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys Lys Lys Glu  
 20 25 30  
 Gly Gly Ser Phe Gly Lys Cys Ser Tyr Ser Ala Cys Trp Cys Lys Gly  
 35 40 45  
 Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys Thr Cys  
 50 55 60

<210> 13  
 <211> 273  
 <212> DNA  
 <213> Centruroides exilicauda

<220>

<221> CDS  
 <222> (1)..(219)  
 <223> Product= Sodium channel modifier toxin precursor

<220>  
 <221> 3'UTR  
 <222> (223)..(273)  
 <223> 3'UTR

<220>  
 <221> mat\_peptide  
 <222> (22)..()  
 <223> Product= Sodium channel modifier toxin

<220>  
 <221> sig\_peptide  
 <222> (1)..(21)  
 <223> Carboxy term of signal peptide

<400> 13  
 gct aca gga aat gtg tgg gca aag gac ggt tat ctg gtg atc att aaa 48  
 Ala Thr Gly Asn Val Trp Ala Lys Asp Gly Tyr Leu Val Ile Ile Lys  
 -5 -1 1 5  
 acg ggc tgc aaa tac aat tgc tat ata ttg gga aaa aac aaa tac tgc 96  
 Thr Gly Cys Lys Tyr Asn Cys Tyr Ile Leu Gly Lys Asn Lys Tyr Cys  
 10 15 20 25  
 aat tcg gaa tgc aaa gag gta ggt gct ggt tac ggc tat tgc tat gct 144  
 Asn Ser Glu Cys Lys Glu Val Gly Ala Gly Tyr Gly Tyr Cys Tyr Ala  
 30 35 40  
 ttt ggg tgc tgg tgc gaa gga tta ccc gaa agt ata ccg acc tgg ccc 192  
 Phe Gly Cys Trp Cys Glu Gly Leu Pro Glu Ser Ile Pro Thr Trp Pro  
 45 50 55  
 ctt cct gat aaa aca tgt ggc aca aaa taatggcaac gtctttttat 239  
 Leu Pro Asp Lys Thr Cys Gly Thr Lys  
 60 65  
 tgtccaccaa cagaaatatt gtaacgcttc ttaa 273

<210> 14  
 <211> 73  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 14  
 Ala Thr Gly Asn Val Trp Ala Lys Asp Gly Tyr Leu Val Ile Ile Lys  
 -5 -1 1 5  
 Thr Gly Cys Lys Tyr Asn Cys Tyr Ile Leu Gly Lys Asn Lys Tyr Cys  
 10 15 20 25

Asn Ser Glu Cys Lys Glu Val Gly Ala Gly Tyr Gly Tyr Cys Tyr Ala  
                     30                    35                    40

Phe Gly Cys Trp Cys Glu Gly Leu Pro Glu Ser Ile Pro Thr Trp Pro  
                     45                    50                    55

Leu Pro Asp Lys Thr Cys Gly Thr Lys  
                     60                    65

<210> 15  
 <211> 198  
 <212> DNA  
 <213> Centruroides exilicauda  
  
 <220>  
 <221> CDS  
 <222> (1)..(198)  
 <223> Product= Sodium channel modifier toxin

<400> 15  
 aag gac ggt tat ctg gtg atc att aaa acg ggc tgc aaa tac aat tgc 48  
 Lys Asp Gly Tyr Leu Val Ile Ile Lys Thr Gly Cys Lys Tyr Asn Cys  
 1                    5                    10                    15  
  
 tat ata ttg gga aaa aac aaa tac tgc aat tcg gaa tgc aaa gag gta 96  
 Tyr Ile Leu Gly Lys Asn Lys Tyr Cys Asn Ser Glu Cys Lys Glu Val  
                     20                    25                    30  
  
 ggt gct ggt tac ggc tat tgc tat gct ttt ggg tgc tgg tgc gaa gga 144  
 Gly Ala Gly Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys Glu Gly  
                     35                    40                    45  
  
 tta ccc gaa agt ata ccg acc tgg ccc ctt cct gat aaa aca tgt ggc 192  
 Leu Pro Glu Ser Ile Pro Thr Trp Pro Leu Pro Asp Lys Thr Cys Gly  
                     50                    55                    60  
  
 aca aaa 198  
 Thr Lys  
 65

<210> 16  
 <211> 66  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 16

Lys Asp Gly Tyr Leu Val Ile Ile Lys Thr Gly Cys Lys Tyr Asn Cys  
 1                    5                    10                    15

Tyr Ile Leu Gly Lys Asn Lys Tyr Cys Asn Ser Glu Cys Lys Glu Val

20

25

30

Gly Ala Gly Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys Glu Gly  
           35                                  40                                  45

Leu Pro Glu Ser Ile Pro Thr Trp Pro Leu Pro Asp Lys Thr Cys Gly  
       50                                  55                                  60

Thr Lys  
 65

<210> 17  
 <211> 261  
 <212> DNA  
 <213> *Centruroides exilicauda*

<220>  
 <221> CDS  
 <222> (1)..(207)  
 <223> Product= Sodium channel modifier toxin precursor  
       In the mature peptide, the last Cys is amidated, and the last Gly  
       and the last 2 basic aminoacids are cut

<220>  
 <221> 3'UTR  
 <222> (211)..(261)  
 <223> 3'UTR

<220>  
 <221> sig\_peptide  
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 <223> Carboxy end of the signal peptide

<220>  
 <221> mat\_peptide  
 <222> (4)..()  
 <223> Product= Sodium channel modifier toxin

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 Ala Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu  
 -1 1                                  5                                  10                                  15  
  
 tgc ttt tgg ttg gga aaa aac gaa ttc tgc gat aag gaa tgc aaa gcg 96  
 Cys Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala  
                                   20                                  25                                  30  
  
 aag aac caa gga ggt agt tac ggc tat tgc tac tct ttc gca tgc tgg 144  
 Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp  
                                   35                                  40                                  45  
  
 tgc gaa ggt ttg ccc gaa agt aca tcg act tat cct ctt cct aat aaa 192

Cys Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys  
50 55 60

tca tgc ggc aga aaa taatggcaaa gactttttat tgtccatcaa cagaaatatt 247  
Ser Cys Gly Arg Lys  
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gtaacgcttc ttaa 261

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<210> 18
<211> 69
<212> PRT
<213> Centruroides exilicauda
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<400> 18

Ala Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu  
-1 1 5 10 15

Cys Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala  
20 25 30

Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp  
35 40 45

Cys Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys  
50 55 60

Ser Cys Gly Arg Lys  
65

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<210> 19
<211> 195
<212> DNA
<213> Centruroides exilicauda
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<220>
<221> CDS
<222> (1)..(195)
<223> Product= Sodium channel modifier toxin
In the mature peptide, the last Cys is amidated, and the last Gly
and the last 2 basic aminoacids are cut
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<400> 19
aag gat ggt tat ctg gta aac aag agc acg ggc tgc aaa tac gag tgc      48
Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu Cys
1          5          10         15
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t t t t g g t t g g a a a a c c g a a t t c t g c g a t a a g g a a t g c a a a g c g a a g 96  
Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala Lys  
20 25 30



aac caa gga ggt agt tac ggc tat tgc tac tct ttc gca tgc tgg tgc 144  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys  
           35                          40                          45

gaa ggt ttg ccc gaa agt aca tcg act tat cct ctt cct aat aaa tca 192  
 Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys Ser  
           50                          55                          60

tgc 195  
 Cys  
 65

<210> 20  
 <211> 65  
 <212> PRT  
 <213> Centruroides exilicauda

<220>  
 <221> mat\_peptide  
 <222> (58)..()  
 <223> Product= Sodium channel modifier toxin  
           In the mature peptide, the last Cys is amidated, and the last Gly  
           and the last 2 basic aminoacids are cut

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Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu Cys  
 1                          5                          10                          15

Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala Lys  
           20                          25                          30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys  
           35                          40                          45

Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys Ser  
           50                          55                          60

Cys  
 65

<210> 21  
 <211> 314  
 <212> DNA  
 <213> Centruroides exilicauda

<220>  
 <221> mat\_peptide  
 <222> (58)..()  
 <223> Product= Sodium channel modifier toxin  
           In the mature peptide, the last Cys is amidated, and the last Gly  
           and the last 2 basic aminoacids are cut

<220>  
 <221> 3'UTR  
 <222> (265)..(314)  
 <223> 3'UTR

<220>  
 <221> sig\_peptide  
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<220>  
 <221> CDS  
 <222> (1)..(261)  
 <223> Product= Sodium channel modifier toxin precursor

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 -15 -10 -5  
 gtg tgg gca aag gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa 96  
 Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys  
 -1 1 5 10  
 tac gag tgc ttt tgg ttg gga aaa aac gaa ttc tgc gat aag gaa tgc 144  
 Tyr Glu Cys Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys  
 15 20 25  
 aaa gcg aag aac caa gga ggt agt tac ggc tat tgc tac tct ttc gca 192  
 Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala  
 30 35 40 45  
 tgc tgg tgc gaa ggt ttg ccc gaa agt aca tcg act tat cct ctt cct 240  
 Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro  
 50 55 60  
 aat aaa tca tgc ggc aga aaa taatggcaaa gactttttat tgtccatcaa 291  
 Asn Lys Ser Cys Gly Arg Lys  
 65  
 cagaaatatt gtaacgcttc tta 314

<210> 22  
 <211> 87  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 22  
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Phe Leu Ile Gly Thr  
 -15 -10 -5  
 Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys  
 -1 1 5 10

Tyr Glu Cys Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys  
 15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala  
 30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro  
 50 55 60

Asn Lys Ser Cys Gly Arg Lys  
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<210> 23  
 <211> 195  
 <212> DNA  
 <213> Centruroides exilicauda

<220>  
 <221> CDS  
 <222> (1)..(195)  
 <223> Product= Sodium channel modifier toxin

<400> 23  
 aag gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac gag tgc 48  
 Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu Cys  
 1 5 10 15

ttt tgg ttg gga aaa aac gaa ttc tgc gat aag gaa tgc aaa gcg aag 96  
 Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala Lys  
 20 25 30

aac caa gga ggt agt tac ggc tat tgc tac tct ttc gca tgc tgg tgc 144  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys  
 35 40 45

gaa ggt ttg ccc gaa agt aca tcg act tat cct ctt cot aat aaa tca 192  
 Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys Ser  
 50 55 60

tgc 195  
 Cys  
 65

<210> 24  
 <211> 65  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 24

Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu Cys  
 1 5 10 15

Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala Lys  
                   20                  25                  30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys  
           35                  40                  45

Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys Ser  
       50                  55                  60

Cys  
 65

<210> 25  
 <211> 261  
 <212> DNA  
 <213> Centruroides exilicauda

<220>  
 <221> CDS  
 <222> (1)..(207)  
 <223> Product= Sodium channel modifier toxin precursor  
       In the mature peptide, the last Cys is amidated, and the last Gly  
       and the last 2 basic aminoacids are cut

<220>  
 <221> 3'UTR  
 <222> (211)..(261)  
 <223> 3'UTR

<220>  
 <221> mat\_peptide  
 <222> (4)..()  
 <223> Product= Sodium channel modifier toxin

<220>  
 <221> sig\_peptide  
 <222> (1)..(3)  
 <223> Carboxy end of the signal peptide

<400> 25  
 gca aag gac ggt tat ctg gta agc aag agc acg ggc tgc aaa tac gag 48  
 Ala Lys Asp Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu  
 -1 1                  5                  10                  15

tgc ttt tgg ttg gga aaa aac gaa ggc tgc gat aag gaa tgc aaa gcg 96  
 Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala  
                   20                  25                  30

ccg aac caa gga ggt ggt tac ggc tat tgc cac gct ttc gca tgc tgg 144  
 Pro Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp

	35	40	45	
tgc gaa aat ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa				192
Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys				
	50	55	60	
tca tgc ggc aaa aaa taatgaaaac gactttttat tgtcctccaa cagaaatatt				247
Ser Cys Gly Lys Lys				
	65			
gtaacgcttc ttaa				261

<210> 26  
 <211> 69  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 26

Ala Lys Asp Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu				
-1 1	5	10	15	

Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala				
	20	25	30	

Pro Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp				
	35	40	45	

Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys				
	50	55	60	

Ser Cys Gly Lys Lys	
65	

<210> 27  
 <211> 195  
 <212> DNA  
 <213> Centruroides exilicauda

<220>  
 <221> CDS  
 <222> (1)..(195)  
 <223> Product= Sodium channel modifier toxin

aag gac ggt tat ctg gta agc aag agc acg ggc tgc aaa tac gag tgc				48
Lys Asp Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu Cys				
1	5	10	15	
ttt tgg ttg gga aaa aac gaa ggc tgc gat aag gaa tgc aaa gcg ccg				96
Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Pro				
	20	25	30	

aac caa gga ggt ggt tac ggc tat tgc cac gct ttc gca tgc tgg tgc 144  
 Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys  
           35                          40                          45

gaa aat ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa tca 192  
 Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser  
           50                          55                          60

tgc 195  
 Cys  
 65

<210> 28  
 <211> 65  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 28

Lys Asp Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu Cys  
 1                          5                          10                          15

Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Pro  
           20                          25                          30

Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys  
           35                          40                          45

Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser  
           50                          55                          60

Cys  
 65

<210> 29  
 <211> 261  
 <212> DNA  
 <213> Centruroides exilicauda

<220>  
 <221> CDS  
 <222> (1)..(207)  
 <223> Product= Sodium channel modifier toxin precursor  
       In the mature peptide, the last Cys is amidated, and the last Gly  
       and the last 2 basic aminoacids are cut

<220>  
 <221> 3'UTR  
 <222> (211)..(261)  
 <223> 3'UTR

<220>  
 <221> sig\_peptide  
 <222> (1)..(3)  
 <223> Carboxy end of the signal peptide

<220>  
 <221> mat\_peptide  
 <222> (4)..()  
 <223> Product= Sodium channel modifier toxin

<400> 29  
 gca agg gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac gag 48  
 Ala Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu  
 -1 1 5 10 15  
 tgc ttt tgg ttg gga aaa aac gaa ttc tgc gat aag gaa tgc aaa gcg 96  
 Cys Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala  
 20 25 30  
 aag aac caa gga ggt agt tac ggc tat tgc tac tct ttc gca tgc tgg 144  
 Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp  
 35 40 45  
 tgc gaa ggt ttg ccc gaa agt aca tcg act tat cct ctt cct aat aaa 192  
 Cys Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys  
 50 55 60  
 tca tgc ggc aga aaa taatggcaaaa gacttttttat tgtccatcaa cagaaatatt 247  
 Ser Cys Gly Arg Lys  
 65  
 gtaacgcttc ttaa 261

<210> 30  
 <211> 69  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 30  
 Ala Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu  
 -1 1 5 10 15  
 Cys Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala  
 20 25 30  
 Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp  
 35 40 45  
 Cys Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys  
 50 55 60

Ser Cys Gly Arg Lys  
65

<210> 31  
<211> 195  
<212> DNA  
<213> *Centruroides exilicauda*  
  
<220>  
<221> CDS  
<222> (1)..(195)  
<223> Product= Sodium channel modifier toxin

<400> 31  
agg gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac gag tgc 48  
Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu Cys  
1 5 10 15  
  
ttt tgg ttg gga aaa aac gaa ttc tgc gat aag gaa tgc aaa gcg aag 96  
Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala Lys  
20 25 30  
  
aac caa gga ggt agt tac ggc tat tgc tac tct ttc gca tgc tgg tgc 144  
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys  
35 40 45  
  
gaa ggt ttg ccc gaa agt aca tcg act tat cct ctt cct aat aaa tca 192  
Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys Ser  
50 55 60  
  
tgc 195  
Cys  
65

<210> 32  
<211> 65  
<212> PRT  
<213> *Centruroides exilicauda*

<400> 32  
  
Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu Cys  
1 5 10 15  
  
Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala Lys  
20 25 30  
  
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys  
35 40 45  
  
Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys Ser  
50 55 60



Cys  
65

<210> 33  
<211> 261  
<212> DNA  
<213> Centruroides exilicauda

<220>  
<221> CDS  
<222> (1)..(207)  
<223> Product= Sodium channel modifier toxin precursor  
In the mature peptide, the last Cys is amidated, and the last Gly  
and the last 2 basic aminoacids are cut

<220>  
<221> 3'UTR  
<222> (211)..(261)  
<223> 3'UTR

<220>  
<221> sig\_peptide  
<222> (1)..(3)  
<223> sig\_peptide

<220>  
<221> mat\_peptide  
<222> (4)..()  
<223> Product= Sodium channel modifier toxin

<400> 33  
gca agg gag ggt tat ctg gta agc aag agc acg ggc tgc aaa tac gag 48  
Ala Arg Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu  
-1 1 5 10 15  
  
tgc ttt tgg ttg gga aaa aac gaa ggc tgc gat aag gaa tgc aaa gcg 96  
Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala  
20 25 30  
  
ccg aac caa gga ggt ggt tac ggc tat tgc cac gct ttc gca tgc tgg 144  
Pro Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp  
35 40 45  
  
tgc gaa aat ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa 192  
Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys  
50 55 60  
  
tca tgc ggc aaa aaa taatggcaaa gacttttttat tgtccatcaa cagaaatatt 247  
Ser Cys Gly Lys Lys  
65  
  
gtaacgcttc ttaa 261

<210> 34

<211> 69  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 34

Ala Arg Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu  
 -1 1 5 10 15

Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala  
 20 25 30

Pro Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp  
 35 40 45

Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys  
 50 55 60

Ser Cys Gly Lys Lys  
 65

<210> 35  
 <211> 195  
 <212> DNA  
 <213> Centruroides exilicauda

<220>  
 <221> CDS  
 <222> (1)..(195)  
 <223> Product= Sodium channel modifier toxin

<400> 35  
 agg gag ggt tat ctg gta agc aag agc acg ggc tgc aaa tac gag tgc 48  
 Arg Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu Cys  
 1 5 10 15

ttt tgg ttg gga aaa aac gaa ggc tgc gat aag gaa tgc aaa gcg ccg 96  
 Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Pro  
 20 25 30

aac caa gga ggt ggt tac ggc tat tgc cac gct ttc gca tgc tgg tgc 144  
 Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys  
 35 40 45

gaa aat ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa tca 192  
 Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser  
 50 55 60

tgc 195  
 Cys  
 65

<210> 36  
 <211> 65  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 36

Arg Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu Cys  
 1 5 10 15

Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Pro  
 20 25 30

Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys  
 35 40 45

Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser  
 50 55 60

Cys  
 65

<210> 37  
 <211> 254  
 <212> DNA  
 <213> Centruroides exilicauda

<220>  
 <221> CDS  
 <222> (1)..(201)  
 <223> Product= Sodium channel modifier toxin precursor  
 In the mature peptide, the last Cys is amidated, and the last Gly  
 and the last 2 basic aminoacids are cut

<220>  
 <221> 3'UTR  
 <222> (205)..(254)  
 <223> 3'UTR

<220>  
 <221> sig\_peptide  
 <222> (1)..(3)  
 <223> Carboxy end of the signal peptide

<220>  
 <221> mat\_peptide  
 <222> (4)..()  
 <223> Product= Sodium channel modifier toxin

<400> 37  
 gca aag gaa ggt tat ctg gtg aac ata tac acg ggc tgc aaa tac agt

Ala Lys Glu Gly Tyr Leu Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser  
 -1 1 5 10 15

tgc tgg ttg ttg gga gaa aac gaa tat tgc att gcg gaa tgc aaa gag 96  
 Cys Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu  
 20 25 30

ata gga gct ggt tac ggc tat tgc cac ggt ttt ggg tgc tgg tgc gaa 144  
 Ile Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu  
 35 40 45

caa ttt cca gaa aat aaa ccg tct tat ccc tat cct gaa aaa tca tgc 192  
 Gln Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys  
 50 55 60

ggc aga aaa taagtaacgt ctttttattg tctgcgcaaa agaattattg 241  
 Gly Arg Lys  
 65

taacgcttct taa 254

<210> 38  
 <211> 67  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 38

Ala Lys Glu Gly Tyr Leu Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser  
 -1 1 5 10 15

Cys Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu  
 20 25 30

Ile Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu  
 35 40 45

Gln Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys  
 50 55 60

Gly Arg Lys  
 65

<210> 39  
 <211> 189  
 <212> DNA  
 <213> Centruroides exilicauda

<220>  
 <221> CDS  
 <222> (1)..(189)  
 <223> Product= Sodium channel modifier toxin

```

<400> 39
aag gaa ggt tat ctg gtg aac ata tac acg ggc tgc aaa tac agt tgc      48
Lys Glu Gly Tyr Leu Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser Cys
1          5          10          15

tgg ttg ttg gga gaa aac gaa tat tgc att gcg gaa tgc aaa gag ata      96
Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile
          20          25          30

gga gct ggt tac ggc tat tgc cac ggt ttt ggg tgc tgg tgc gaa caa      144
Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln
          35          40          45

ttt cca gaa aat aaa ccg tct tat ccc tat cct gaa aaa tca tgc      189
Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys
          50          55          60

```

```

<210> 40
<211> 63
<212> PRT
<213> Centruroides exilicauda

```

```

<400> 40

Lys Glu Gly Tyr Leu Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser Cys
1          5          10          15

Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile
          20          25          30

Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln
          35          40          45

Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys
          50          55          60

```

```

<210> 41
<211> 254
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS
<222> (1)..(204)
<223> Product= Sodium channel modifier toxin precursor
      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

<220>
<221> 3'UTR
<222> (205)..(254)
<223> 3'UTR

```

<400> 41  
aag gac ggt tat ccg gtg gag gtc acg ggc tgc aaa aag tct tgc tat 48  
Lys Asp Gly Tyr Pro Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr  
1 5 10 15

aaa ttg gga gaa aac aaa ttc tgc aat agg gaa tgc aaa atg aag cac 96  
Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His  
20 25 30

cga gga ggt agt tac ggc tat tgc tat ttt ttt ggg tgc tat tgc gaa 144  
Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu  
35 40 45

gga ttg gcc gaa agt aca ccg act tgg ccc ctt cct aat aaa tca tgc 192  
Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys  
50 55 60

ggc aaa aaa taa tggcaacgct gttctattgg ccaccaacgg aaatatttaa 244  
Gly Lys Lys  
65

cgcttcttaa 254

<210> 42  
<211> 67  
<212> PRT  
<213> Centruroides exilicauda

<400> 42  
Lys Asp Gly Tyr Pro Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr  
1 5 10 15

Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His  
20 25 30

Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu  
35 40 45

Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys  
50 55 60

Gly Lys Lys  
65

<210> 43  
<211> 192  
<212> DNA  
<213> Centruroides exilicauda

<220>  
<221> CDS

<222> (1)..(192)

<223> Product= Sodium channel modifier toxin

<400> 43

aag	gac	ggt	tat	ccg	gtg	gag	gtc	acg	ggc	tgc	aaa	aag	tct	tgc	tat	48
Lys	Asp	Gly	Tyr	Pro	Val	Glu	Val	Thr	Gly	Cys	Lys	Lys	Ser	Cys	Tyr	
1				5				10						15		

aaa	ttg	gga	gaa	aac	aaa	ttc	tgc	aat	agg	gaa	tgc	aaa	atg	aag	cac	96
Lys	Leu	Gly	Glu	Asn	Lys	Phe	Cys	Asn	Arg	Glu	Cys	Lys	Met	Lys	His	
		20					25					30				

cga	gga	ggt	agt	tac	ggc	tat	tgc	tat	ttt	ttt	ggg	tgc	tat	tgc	gaa	144
Arg	Gly	Gly	Ser	Tyr	Gly	Tyr	Cys	Tyr	Phe	Phe	Gly	Cys	Tyr	Cys	Glu	
		35				40					45					

gga	ttg	gcc	gaa	agt	aca	ccg	act	tgg	ccc	ctt	cct	aat	aaa	tca	tgc	192
Gly	Leu	Ala	Glu	Ser	Thr	Pro	Thr	Trp	Pro	Leu	Pro	Asn	Lys	Ser	Cys	
	50					55				60						

<210> 44

<211> 64

<212> PRT

<213> Centruroides exilicauda

<400> 44

Lys	Asp	Gly	Tyr	Pro	Val	Glu	Val	Thr	Gly	Cys	Lys	Lys	Ser	Cys	Tyr
1				5				10						15	

Lys	Leu	Gly	Glu	Asn	Lys	Phe	Cys	Asn	Arg	Glu	Cys	Lys	Met	Lys	His
		20					25					30			

Arg	Gly	Gly	Ser	Tyr	Gly	Tyr	Cys	Tyr	Phe	Phe	Gly	Cys	Tyr	Cys	Glu
		35				40					45				

Gly	Leu	Ala	Glu	Ser	Thr	Pro	Thr	Trp	Pro	Leu	Pro	Asn	Lys	Ser	Cys
	50					55				60					

<210> 45

<211> 258

<212> DNA

<213> Centruroides exilicauda

<220>

<221> CDS

<222> (1)..(204)

<223> Product= Sodium channel modifier toxin precursor

In the mature peptide, the last Cys is amidated, and the last Gly and the last 2 basic aminoacids are cut

<220>

&lt;221&gt; 3'UTR

&lt;222&gt; (205)..(258)

&lt;223&gt; 3'UTR

&lt;400&gt; 45

```

aag gac ggt tat ctg gtg gag gtc acg ggc tgc aaa aag tct tgc tat      48
Lys Asp Gly Tyr Leu Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr
1          5          10          15

```

```

aaa ttg gga gaa aac aaa ttc tgc aat agg gaa tgc aaa atg aag cac      96
Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His
          20          25          30

```

```

cga gga ggt agt tac ggc tat tgc tat ttt ttt ggg tgc tat tgc gaa      144
Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu
          35          40          45

```

```

gga ttg gcc gaa agt aca ccg act tgg ccc ctt cct aat aaa tca tgc      192
Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys
          50          55          60

```

```

ggc aaa aaa taa tggcaacgct gttctattgg ccaccaacgg aaatatttaa      244
Gly Lys Lys
65

```

```

cgcttcttaa ttgc      258

```

&lt;210&gt; 46

&lt;211&gt; 67

&lt;212&gt; PRT

&lt;213&gt; Centruroides exilicauda

&lt;400&gt; 46

```

Lys Asp Gly Tyr Leu Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr
1          5          10          15

```

```

Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His
          20          25          30

```

```

Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu
          35          40          45

```

```

Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys
          50          55          60

```

```

Gly Lys Lys
65

```

&lt;210&gt; 47

&lt;211&gt; 192

&lt;212&gt; DNA

&lt;213&gt; Centruroides exilicauda



<220>  
 <221> CDS  
 <222> (1)..(192)  
 <223> Product= Sodium channel modifier toxin

<400> 47  
 aag gac ggt tat ctg gtg gag gtc acg ggc tgc aaa aag tct tgc tat 48  
 Lys Asp Gly Tyr Leu Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr  
 1 5 10 15  
 aaa ttg gga gaa aac aaa ttc tgc aat agg gaa tgc aaa atg aag cac 96  
 Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His  
 20 25 30  
 cga gga ggt agt tac ggc tat tgc tat ttt ttt ggg tgc tat tgc gaa 144  
 Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu  
 35 40 45  
 gga ttg gcc gaa agt aca ccg act tgg ccc ctt cct aat aaa tca tgc 192  
 Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys  
 50 55 60

<210> 48  
 <211> 64  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 48  
 Lys Asp Gly Tyr Leu Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr  
 1 5 10 15  
 Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His  
 20 25 30  
 Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu  
 35 40 45  
 Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys  
 50 55 60

<210> 49  
 <211> 252  
 <212> DNA  
 <213> Centruroides exilicauda

<220>  
 <221> CDS  
 <222> (1)..(201)  
 <223> Product= Sodium channel modifier toxin precursor  
 In the mature peptide, the last Cys is amidated, and the last Gly  
 and the last 2 basic aminoacids are cut

<220>  
 <221> 3'UTR  
 <222> (202)..(252)  
 <223> 3'UTR

<400> 49  
 aag gag ggt tat ccg gtg aac ata tac acg ggc tgc aaa tac agt tgc 48  
 Lys Glu Gly Tyr Pro Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser Cys  
 1 5 10 15  
 tgg ttg ttg gga gaa aac gaa tat tgc att gcg gaa tgc aaa gag ata 96  
 Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile  
 20 25 30  
 gga gct ggt tac ggc tat tgc cac ggt ttt ggg tgc tgg tgc gaa caa 144  
 Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln  
 35 40 45  
 ttt cca gaa aat aaa ccg tct tat ccc tat cct gaa aaa tca tgc ggc 192  
 Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys Gly  
 50 55 60  
 aga aaa taa tagcaacgtc tttttattgt ctgccaaaag aattattgta 241  
 Arg Lys  
 65  
 acgcttctta a 252

<210> 50  
 <211> 66  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 50  
 Lys Glu Gly Tyr Pro Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser Cys  
 1 5 10 15  
 Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile  
 20 25 30  
 Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln  
 35 40 45  
 Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys Gly  
 50 55 60  
 Arg Lys  
 65  
 <210> 51

<211> 189  
 <212> DNA  
 <213> *Centruroides exilicauda*

<220>  
 <221> CDS  
 <222> (1)..(189)  
 <223> Product= Sodium channel modifier toxin

<400> 51  
 aag gag ggt tat ccg gtg aac ata tac acg ggc tgc aaa tac agt tgc 48  
 Lys Glu Gly Tyr Pro Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser Cys  
 1 5 10 15  
 tgg ttg ttg gga gaa aac gaa tat tgc att gcg gaa tgc aaa gag ata 96  
 Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile  
 20 25 30  
 gga gct ggt tac ggc tat tgc cac ggt ttt ggg tgc tgg tgc gaa caa 144  
 Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln  
 35 40 45  
 ttt cca gaa aat aaa ccg tct tat ccc tat cct gaa aaa tca tgc 189  
 Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys  
 50 55 60

<210> 52  
 <211> 63  
 <212> PRT  
 <213> *Centruroides exilicauda*

<400> 52  
 Lys Glu Gly Tyr Pro Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser Cys  
 1 5 10 15  
 Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile  
 20 25 30  
 Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln  
 35 40 45  
 Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys  
 50 55 60

<210> 53  
 <211> 322  
 <212> DNA  
 <213> *Centruroides limpidus limpidus*

<220>  
 <221> CDS  
 <222> (5)..(265)

<223> Product= Sodium channel modifier toxin precursor  
 In the mature peptide, the last Asn is amidated, and the last Gly and the last basic aminoacid are cut

<220>  
 <221> mat\_peptide  
 <222> (62)..()  
 <223> Product= Sodium channel modifier toxin

<220>  
 <221> sig\_peptide  
 <222> (5)..(61)  
 <223> sig\_peptide

<220>  
 <221> 3'UTR  
 <222> (269)..(322)  
 <223> 3'UTR

<220>  
 <221> 5'UTR  
 <222> (1)..(4)  
 <223> 5'UTR

<400> 53  
 gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gcc ctg gtc gga 49  
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Val Gly  
 -15 -10 -5

aca gtg tgg gca aag gaa ggt tat ctg gta aac cac tcc acg ggg tgc 97  
 Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn His Ser Thr Gly Cys  
 -1 1 5 10

aaa tac gaa tgc tat aaa ttg gga gac aac gat tat tgc cta agg gaa 145  
 Lys Tyr Glu Cys Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu  
 15 20 25

tgc aaa cag cag tac gga aaa ggt gct ggt ggc tat tgc tac gct ttt 193  
 Cys Lys Gln Gln Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe  
 30 35 40

ggg tgc tgg tgc aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt 241  
 Gly Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu  
 45 50 55 60

cct aag aaa aca tgc aac gga aaa taatggcaac gactttttat tgtccaccaa 295  
 Pro Lys Lys Thr Cys Asn Gly Lys  
 65

cagaaatatt gtaacgcttc ttaattg 322

<210> 54  
 <211> 87  
 <212> PRT  
 <213> Centruroides limpidus limpidus

&lt;400&gt; 54

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Val Gly Thr  
                   -15                  -10                  -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn His Ser Thr Gly Cys Lys  
           -1  1                          5                          10

Tyr Glu Cys Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys  
       15                          20                          25

Lys Gln Gln Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly  
   30                          35                          40                          45

Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro  
                           50                          55                          60

Lys Lys Thr Cys Asn Gly Lys  
                   65

&lt;210&gt; 55

&lt;211&gt; 198

&lt;212&gt; DNA

&lt;213&gt; Centruroides limpidus limpidus

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(198)

&lt;223&gt; Product= Sodium channel modifier toxin Cl14

&lt;400&gt; 55

aag gaa ggt tat ctg gta aac cac tcc acg ggg tgc aaa tac gaa tgc 48  
 Lys Glu Gly Tyr Leu Val Asn His Ser Thr Gly Cys Lys Tyr Glu Cys  
 1                          5                          10                          15

tat aaa ttg gga gac aac gat tat tgc cta agg gaa tgc aaa cag cag 96  
 Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Gln Gln  
                   20                          25                          30

tac gga aaa ggt gct ggt ggc tat tgc tac gct ttt ggg tgc tgg tgc 144  
 Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys  
           35                          40                          45

aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt cct aag aaa aca 192  
 Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Thr  
       50                          55                          60

tgc aac 198  
 Cys Asn  
 65

<210> 56  
 <211> 66  
 <212> PRT  
 <213> Centruroides limpidus limpidus

<400> 56

Lys Glu Gly Tyr Leu Val Asn His Ser Thr Gly Cys Lys Tyr Glu Cys  
 1 5 10 15

Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Gln Gln  
 20 25 30

Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys  
 35 40 45

Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Thr  
 50 55 60

Cys Asn  
 65

<210> 57  
 <211> 322  
 <212> DNA  
 <213> Centruroides limpidus limpidus

<220>  
 <221> CDS  
 <222> (5)..(265)  
 <223> Product= Sodium channel modifier toxin precursor  
 In the mature peptide, the last Tyr is amidated, and the last Gl  
 y and the last basic aminoacid are cut

<220>  
 <221> 3'UTR  
 <222> (269)..(322)  
 <223> 3'UTR

<220>  
 <221> 5'UTR  
 <222> (1)..(4)  
 <223> 5'UTR

<220>  
 <221> mat\_peptide  
 <222> (62)..()  
 <223> Product= Sodium channel modifier toxin

<220>  
 <221> sig\_peptide  
 <222> (5)..(61)

<223> sig\_peptide

<400> 57

gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gcc gtg atc gga 49  
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Val Ile Gly  
-15 -10 -5

aca gtg tgg gca aag gaa ggt tat att gta aac tac tac gat ggc tgc 97  
Thr Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr Tyr Asp Gly Cys  
-1 1 5 10

aaa tac gca tgt ctt aaa tta gga gag aac gat tat tgc tta agg gaa 145  
Lys Tyr Ala Cys Leu Lys Leu Gly Glu Asn Asp Tyr Cys Leu Arg Glu  
15 20 25

tgc aaa gcg aga tac tac aaa tct gct ggc ggc tat tgc tac gct ttt 193  
Cys Lys Ala Arg Tyr Tyr Lys Ser Ala Gly Gly Tyr Cys Tyr Ala Phe  
30 35 40

gcg tgc tgg tgc aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt 241  
Ala Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu  
45 50 55 60

cct aat aaa aca tgc tac gga aaa taatggcaac gacttttttat tgtccaccaa 295  
Pro Asn Lys Thr Cys Tyr Gly Lys  
65

cagaaatatt gtaacgcttc ttaattg 322

<210> 58

<211> 87

<212> PRT

<213> Centruroides limpidus limpidus

<400> 58

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Val Ile Gly Thr  
-15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr Tyr Asp Gly Cys Lys  
-1 1 5 10

Tyr Ala Cys Leu Lys Leu Gly Glu Asn Asp Tyr Cys Leu Arg Glu Cys  
15 20 25

Lys Ala Arg Tyr Tyr Lys Ser Ala Gly Gly Tyr Cys Tyr Ala Phe Ala  
30 35 40 45

Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro  
50 55 60

Asn Lys Thr Cys Tyr Gly Lys  
65

<210> 59  
 <211> 198  
 <212> DNA  
 <213> Centruroides limpidus limpidus  
  
 <220>  
 <221> CDS  
 <222> (1)..(198)  
 <223> Product= Sodium channel modifier toxin

<400> 59  
 aag gaa ggt tat att gta aac tac tac gat ggc tgc aaa tac gca tgt 48  
 Lys Glu Gly Tyr Ile Val Asn Tyr Tyr Asp Gly Cys Lys Tyr Ala Cys  
 1 5 10 15  
  
 ctt aaa tta gga gag aac gat tat tgc tta agg gaa tgc aaa gcg aga 96  
 Leu Lys Leu Gly Glu Asn Asp Tyr Cys Leu Arg Glu Cys Lys Ala Arg  
 20 25 30  
  
 tac tac aaa tct gct ggc ggc tat tgc tac gct ttt gcg tgc tgg tgc 144  
 Tyr Tyr Lys Ser Ala Gly Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys  
 35 40 45  
  
 aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt cct aat aaa aca 192  
 Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Asn Lys Thr  
 50 55 60  
  
 tgc tac 198  
 Cys Tyr  
 65

<210> 60  
 <211> 66  
 <212> PRT  
 <213> Centruroides limpidus limpidus

<400> 60  
 Lys Glu Gly Tyr Ile Val Asn Tyr Tyr Asp Gly Cys Lys Tyr Ala Cys  
 1 5 10 15  
  
 Leu Lys Leu Gly Glu Asn Asp Tyr Cys Leu Arg Glu Cys Lys Ala Arg  
 20 25 30  
  
 Tyr Tyr Lys Ser Ala Gly Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys  
 35 40 45  
  
 Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Asn Lys Thr  
 50 55 60  
  
 Cys Tyr



65

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<210> 61
<211> 322
<212> DNA
<213> Centruroides limpidus limpidus

<220>
<221> CDS
<222> (5)..(265)
<223> Product= Sodium channel modifier toxin precursor
      In the mature peptide, the last Asn is amidated, and the last Gl
      y and the last basic aminoacid are cut

<220>
<221> 3'UTR
<222> (269)..(322)
<223> 3'UTR

<220>
<221> 5'UTR
<222> (1)..(4)
<223> 5'UTR

<220>
<221> mat_peptide
<222> (62)..()
<223> Product= Sodium channel modifier toxin

<220>
<221> sig_peptide
<222> (5)..(61)
<223> sig_peptide

<400> 61
gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gcc ctg ata gga      49
      Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Ile Gly
              -15                      -10                      -5

aca gtg tgg gca aag gaa ggt tat att gta aac tac cac gat ggc tgc      97
Thr Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr His Asp Gly Cys
              -1  1                      5                      10

aaa tac gaa tgc tat aaa ttg gga gac aac gat tat tgc tta agg gaa      145
Lys Tyr Glu Cys Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu
              15                      20                      25

tgc aaa ttg aga tac gga aaa ggt gct ggc ggc tat tgc tac gct ttt      193
Cys Lys Leu Arg Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe
              30                      35                      40

ggg tgc tgg tgc aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt      241
Gly Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu
              45                      50                      55                      60

cca aag aaa aga tgc aat gga aaa taatggcaac gacttttttat tgtccaccaa      295

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Pro Lys Lys Arg Cys Asn Gly Lys  
65

cagaaatatt gtaacgcttc ttaattg

322

<210> 62

<211> 87

<212> PRT

<213> Centruroides limpidus limpidus

<400> 62

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Ile Gly Thr  
-15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr His Asp Gly Cys Lys  
-1 1 5 10

Tyr Glu Cys Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys  
15 20 25

Lys Leu Arg Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly  
30 35 40 45

Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro  
50 55 60

Lys Lys Arg Cys Asn Gly Lys  
65

<210> 63

<211> 198

<212> DNA

<213> Centruroides limpidus limpidus

<220>

<221> CDS

<222> (1)..(198)

<223> Product= Sodium channel modifier toxin

<400> 63

aag gaa ggt tat att gta aac tac cac gat ggc tgc aaa tac gaa tgc 48  
Lys Glu Gly Tyr Ile Val Asn Tyr His Asp Gly Cys Lys Tyr Glu Cys  
1 5 10 15

tat aaa ttg gga gac aac gat tat tgc tta agg gaa tgc aaa ttg aga 96  
Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg  
20 25 30

tac gga aaa ggt gct ggc ggc tat tgc tac gct ttt ggg tgc tgg tgc 144  
Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys

	35	40	45	
aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt cca aag aaa aga				192
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Arg				
50		55	60	

tgc aat	198
Cys Asn	
65	

<210> 64  
 <211> 66  
 <212> PRT  
 <213> Centruroides limpidus limpidus

<400> 64

Lys Glu Gly Tyr Ile Val Asn Tyr His Asp Gly Cys Lys Tyr Glu Cys	
1	15

Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg	
20	30

Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys	
35	45

Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Arg	
50	60

Cys Asn  
 65

<210> 65  
 <211> 322  
 <212> DNA  
 <213> Centruroides limpidus limpidus

<220>  
 <221> CDS  
 <222> (5)..(265)  
 <223> Product= Sodium channel modifier toxin precursor  
 In the mature peptide, the last 2 basic aminoacids are cut

<220>  
 <221> 3'UTR  
 <222> (269)..(322)  
 <223> 3'UTR

<220>  
 <221> 5'UTR  
 <222> (1)..(4)  
 <223> 5'UTR

<220>  
 <221> mat\_peptide  
 <222> (62)..()  
 <223> Product= Sodium channel modifier toxin

<220>  
 <221> sig\_peptide  
 <222> (5)..(61)  
 <223> sig\_peptide

<400> 65  
 gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gcc gag atc gga 49  
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Glu Ile Gly  
 -15 -10 5  
 aca gtg tgg gca aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc 97  
 Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys  
 -1 1 5 10  
 aaa tac ggt tgc ttc tgg ttg gga aaa aac gaa aac tgc gat aag gaa 145  
 Lys Tyr Gly Cys Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu  
 15 20 25  
 tgc aaa gcg aaa aac caa gga ggt agt tac ggc tat tgc tac tct ttt 193  
 Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe  
 30 35 40  
 gcc tgc tgg tgc gaa ggt ttg ccc gat agt aca ccg act tat ccc ctt 241  
 Ala Cys Trp Cys Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu  
 45 50 55 60  
 cct aat aaa tcg tgc agc aaa aaa taatggcaac gtcttttttat tgtccaccaa 295  
 Pro Asn Lys Ser Cys Ser Lys Lys  
 65  
 cagaaatatt gtaacgcttc ttaattg 322

<210> 66  
 <211> 87  
 <212> PRT  
 <213> Centruroides limpidus limpidus

<400> 66  
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Glu Ile Gly Thr  
 -15 -10 -5  
 Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys  
 -1 1 5 10  
 Tyr Gly Cys Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu Cys  
 15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala  
 30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu Pro  
 50 55 60

Asn Lys Ser Cys Ser Lys Lys  
 65

<210> 67

<211> 198

<212> DNA

<213> Centruroides limpidus limpidus

<220>

<221> CDS

<222> (1)..(198)

<223> Product= Sodium channel modifier toxin

<400> 67

aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac ggt tgc 48  
 Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys  
 1 5 10 15

ttc tgg ttg gga aaa aac gaa aac tgc gat aag gaa tgc aaa gcg aaa 96  
 Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu Cys Lys Ala Lys  
 20 25 30

aac caa gga ggt agt tac ggc tat tgc tac tct ttt gcc tgc tgg tgc 144  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys  
 35 40 45

gaa ggt ttg ccc gat agt aca ccg act tat ccc ctt cct aat aaa tcg 192  
 Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
 50 55 60

tgc agc 198  
 Cys Ser  
 65

<210> 68

<211> 66

<212> PRT

<213> Centruroides limpidus limpidus

<400> 68

Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys  
 1 5 10 15

Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu Cys Lys Ala Lys  
 20 25 30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys  
35 40 45

Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
50 55 60

Cys Ser  
65

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<210> 69
<211> 322
<212> DNA
<213> Centruroides limpidus limpidus
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<220>
<221> CDS
<222> (5)..(265)
<223> Product= Sodium channel modifier toxin precursor
      In the mature peptide, the last 2 basic aminoacids are cut
```

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<220>
<221> 3'UTR
<222> (269) .. (322)
<223> 3'UTR
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<220>  
<221> 5' UTR  
<222> (1) .. (4)  
<223> 5' UTR

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<220>
<221> mat_peptide
<222> (62)..()
<223> Product= Sodium channel modifier toxin
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<220>
<221>   sig_peptide
<222>   (5)..(61)
<223>   sig_peptide
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<400> 69
gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc cta ttc gga      49
      Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly
              -15                      -10                      -5

```

aca gtg tgg gca aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc 97  
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys  
-1 1 5 10

aaa tac ggt tgc ttc tgg ttg gga aaa aac gaa aac tgc gat atg gaa 145  
Lys Tyr Gly Cys Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Met Glu  
15 20 25

tgc aaa gcg aaa aac caa gga ggt agt tac ggc tat tgc tac tct ttt 193  
 Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe  
 30 35 40

gcc tgc tgg tgc gaa ggt ttg ccc gat agt aca ccg act tat ccc ctt 241  
 Ala Cys Trp Cys Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu  
 45 50 55 60

cct aat aaa tcg tgc agc aaa aaa taatggcaac gtcttttttat tgtccaccaa 295  
 Pro Asn Lys Ser Cys Ser Lys Lys  
 65

cagaaatatt gtaacgcttc ttaattg 322

<210> 70

<211> 87

<212> PRT

<213> Centruroides limpidus limpidus

<400> 70

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly Thr  
 -15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys  
 -1 1 5 10

Tyr Gly Cys Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Met Glu Cys  
 15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala  
 30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu Pro  
 50 55 60

Asn Lys Ser Cys Ser Lys Lys  
 65

<210> 71

<211> 198

<212> DNA

<213> Centruroides limpidus limpidus

<220>

<221> CDS

<222> (1)..(198)

<223> Product= Sodium channel modifier toxin

<400> 71

aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac ggt tgc 48

```

Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys
1          5          10          15

ttc tgg ttg gga aaa aac gaa aac tgc gat atg gaa tgc aaa gcg aaa      96
Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Met Glu Cys Lys Ala Lys
          20          25          30

aac caa gga ggt agt tac ggc tat tgc tac tct ttt gcc tgc tgg tgc      144
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys
          35          40          45

gaa ggt ttg ccc gat agt aca ccg act tat ccc ctt cct aat aaa tcg      192
Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
          50          55          60

tgc agc      198
Cys Ser
65

```

```

<210> 72
<211> 66
<212> PRT
<213> Centruroides limpidus limpidus

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```

<400> 72

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Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys
1          5          10          15

Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Met Glu Cys Lys Ala Lys
          20          25          30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys
          35          40          45

Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
          50          55          60

Cys Ser
65

```

```

<210> 73
<211> 316
<212> DNA
<213> Centruroides limpidus limpidus

<220>
<221> CDS
<222> (5)..(259)
<223> Product= Sodium channel modifier toxin precursor
      In the mature peptide, the last Ser is amidated, and the last Gly
      and the last basic aminoacid are cut

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<220>  
 <221> 3'UTR  
 <222> (263)..(316)  
 <223> 3'UTR

<220>  
 <221> 5'UTR  
 <222> (1)..(4)  
 <223> 5'UTR

<220>  
 <221> mat\_peptide  
 <222> (62)..()  
 <223> Product= Sodium channel modifier toxin

<220>  
 <221> sig\_peptide  
 <222> (5)..(61)  
 <223> sig\_peptide

<400> 73  
 gaag atg aac tgc ttg ttg atg att att ggt tgt ttg gtc ctg atc gga 49  
 Met Asn Ser Leu Leu Met Ile Ile Gly Cys Leu Val Leu Ile Gly  
 -15 -10 -5

aca gtg tgg aca aag gaa ggt tat ctg gtg aac atg aaa acg ggc tgc 97  
 Thr Val Trp Thr Lys Glu Gly Tyr Leu Val Asn Met Lys Thr Gly Cys  
 -1 1 5 10

aaa tac ggg tgc tat gaa ttg ggt gac aac ggt tac tgc gat agg aaa 145  
 Lys Tyr Gly Cys Tyr Glu Leu Gly Asp Asn Gly Tyr Cys Asp Arg Lys  
 15 20 25

tgc aaa gcg gag agc ggt aac tac ggc tat tgc tat act gtt ggg tgc 193  
 Cys Lys Ala Glu Ser Gly Asn Tyr Gly Tyr Cys Tyr Thr Val Gly Cys  
 30 35 40

tgg tgc gaa gga ttg ccc aat agt aaa ccg act tgg ccc ctt cct ggt 241  
 Trp Cys Glu Gly Leu Pro Asn Ser Lys Pro Thr Trp Pro Leu Pro Gly  
 45 50 55 60

aaa tca tgc agc gga aaa taatagcaac gtctttttat tgtccaccaa 289  
 Lys Ser Cys Ser Gly Lys  
 65

cagaaatatt gtaacgcttc ttaattg 316

<210> 74  
 <211> 85  
 <212> PRT  
 <213> Centruroides limpidus limpidus

<400> 74  
 Met Asn Ser Leu Leu Met Ile Ile Gly Cys Leu Val Leu Ile Gly Thr  
 -15 -10 -5

Val Trp Thr Lys Glu Gly Tyr Leu Val Asn Met Lys Thr Gly Cys Lys  
 -1 1 5 10

Tyr Gly Cys Tyr Glu Leu Gly Asp Asn Gly Tyr Cys Asp Arg Lys Cys  
 15 20 25

Lys Ala Glu Ser Gly Asn Tyr Gly Tyr Cys Tyr Thr Val Gly Cys Trp  
 30 35 40 45

Cys Glu Gly Leu Pro Asn Ser Lys Pro Thr Trp Pro Leu Pro Gly Lys  
 50 55 60

Ser Cys Ser Gly Lys  
 65

<210> 75

<211> 192

<212> DNA

<213> Centruroides limpidus limpidus

<220>

<221> CDS

<222> (1)..(192)

<223> Product= Sodium channel modifier toxin

<400> 75

aag gaa ggt tat ctg gtg aac atg aaa acg ggc tgc aaa tac ggg tgc 48  
 Lys Glu Gly Tyr Leu Val Asn Met Lys Thr Gly Cys Lys Tyr Gly Cys  
 1 5 10 15

tat gaa ttg ggt gac aac ggt tac tgc gat agg aaa tgc aaa gcg gag 96  
 Tyr Glu Leu Gly Asp Asn Gly Tyr Cys Asp Arg Lys Cys Lys Ala Glu  
 20 25 30

agc ggt aac tac ggc tat tgc tat act gtt ggg tgc tgg tgc gaa gga 144  
 Ser Gly Asn Tyr Gly Tyr Cys Tyr Thr Val Gly Cys Trp Cys Glu Gly  
 35 40 45

ttg ccc aat agt aaa ccg act tgg ccc ctt cct ggt aaa tca tgc agc 192  
 Leu Pro Asn Ser Lys Pro Thr Trp Pro Leu Pro Gly Lys Ser Cys Ser  
 50 55 60

<210> 76

<211> 64

<212> PRT

<213> Centruroides limpidus limpidus

<400> 76

Lys Glu Gly Tyr Leu Val Asn Met Lys Thr Gly Cys Lys Tyr Gly Cys

```

1           5           10           15

Tyr Glu Leu Gly Asp Asn Gly Tyr Cys Asp Arg Lys Cys Lys Ala Glu
      20           25           30

Ser Gly Asn Tyr Gly Tyr Cys Tyr Thr Val Gly Cys Trp Cys Glu Gly
      35           40           45

Leu Pro Asn Ser Lys Pro Thr Trp Pro Leu Pro Gly Lys Ser Cys Ser
      50           55           60

```

```

<210> 77
<211> 316
<212> DNA
<213> Centruroides limpidus limpidus

<220>
<221> CDS
<222> (5)..(259)
<223> Product= Sodium channel modifier toxin precursor
      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

```

```

<220>
<221> 3'UTR
<222> (263)..(316)
<223> 3'UTR

```

```

<220>
<221> 5'UTR
<222> (1)..(4)
<223> 5'UTR

```

```

<220>
<221> mat_peptide
<222> (62)..()
<223> Product= Sodium channel modifier toxin

```

```

<220>
<221> sig_peptide
<222> (5)..(61)
<223> sig_peptide

```

```

<400> 77
gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc cta ttc gga      49
      Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly
              -15                      -10                      -5

aca gtg tgg gca aag gaa ggt tat ctg gtg aac acg tac acg ggc tgc      97
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Thr Tyr Thr Gly Cys
      -1  1                      5                      10

aaa tac att tgc tgg aaa ttg gga gag aac aaa tac tgc att gat gaa      145

```

Lys Tyr Ile Cys Trp Lys Leu Gly Glu Asn Lys Tyr Cys Ile Asp Glu  
 15 20 25  
 tgt aaa gag ata gga gct ggt tac ggc tat tgc tac ggt ttt ggg tgc 193  
 Cys Lys Glu Ile Gly Ala Gly Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys  
 30 35 40  
 tat tgc gaa gga ttt ccc gaa aat aaa ccg acc tgg ccc ctt cct aat 241  
 Tyr Cys Glu Gly Phe Pro Glu Asn Lys Pro Thr Trp Pro Leu Pro Asn  
 45 50 55 60  
 aaa aca tgc ggc aga aaa taatgacaac gtctttttat tgtccaccaa 289  
 Lys Thr Cys Gly Arg Lys  
 65  
 cagaaatatt gtaacgcttc ttaattg 316

<210> 78  
 <211> 85  
 <212> PRT  
 <213> Centruroides limpidus limpidus

<400> 78

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly Thr  
 -15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Thr Tyr Thr Gly Cys Lys  
 -1 1 5 10

Tyr Ile Cys Trp Lys Leu Gly Glu Asn Lys Tyr Cys Ile Asp Glu Cys  
 15 20 25

Lys Glu Ile Gly Ala Gly Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr  
 30 35 40 45

Cys Glu Gly Phe Pro Glu Asn Lys Pro Thr Trp Pro Leu Pro Asn Lys  
 50 55 60

Thr Cys Gly Arg Lys  
 65

<210> 79  
 <211> 189  
 <212> DNA  
 <213> Centruroides limpidus limpidus

<220>  
 <221> CDS  
 <222> (1)..(189)  
 <223> Product= Sodium channel modifier toxin

```

<400> 79
aag gaa ggt tat ctg gtg aac acg tac acg ggc tgc aaa tac att tgc      48
Lys Glu Gly Tyr Leu Val Asn Thr Tyr Thr Gly Cys Lys Tyr Ile Cys
1          5          10          15

tgg aaa ttg gga gag aac aaa tac tgc att gat gaa tgt aaa gag ata      96
Trp Lys Leu Gly Glu Asn Lys Tyr Cys Ile Asp Glu Cys Lys Glu Ile
          20          25          30

gga gct ggt tac ggc tat tgc tac ggt ttt ggg tgc tat tgc gaa gga      144
Gly Ala Gly Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu Gly
          35          40          45

ttt ccc gaa aat aaa ccg acc tgg ccc ctt cct aat aaa aca tgc      189
Phe Pro Glu Asn Lys Pro Thr Trp Pro Leu Pro Asn Lys Thr Cys
          50          55          60

```

```

<210> 80
<211> 63
<212> PRT
<213> Centruroides limpidus limpidus

```

```

<400> 80

Lys Glu Gly Tyr Leu Val Asn Thr Tyr Thr Gly Cys Lys Tyr Ile Cys
1          5          10          15

Trp Lys Leu Gly Glu Asn Lys Tyr Cys Ile Asp Glu Cys Lys Glu Ile
          20          25          30

Gly Ala Gly Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu Gly
          35          40          45

Phe Pro Glu Asn Lys Pro Thr Trp Pro Leu Pro Asn Lys Thr Cys
          50          55          60

```

```

<210> 81
<211> 274
<212> DNA
<213> Centruroides limpidus limpidus

```

```

<220>
<221> CDS
<222> (2)..(217)
<223> Product= Sodium channel modifier toxin precursor

```

In the mature peptide, the last Cys is amidated, and the last Gly and the last 2 basic aminoacids are cut

```

<220>
<221> sig_peptide
<222> (2)..(13)

```

<223> Carboxy end of the signal peptide

**<220>**

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<221> mat_peptide
```

<222> (14) . . ( )

<223> Product= Sodium channel modifier toxin

**<220>**

<221> 3'UTR

<222> (221) . . (274)

<223> 3' UTR

<400> 81

a aca gtg tgc gca aaa gaa ggt tat ctg gtg aag aag agc aat ggt tgc 49  
Thr Val Ser Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asn Gly Cys  
-1 1 5 10

aaa tac gag tgc ttt aaa ttg gga gaa aac gaa cac tgc gat acg gaa 97  
Lys Tyr Glu Cys Phe Lys Leu Gly Glu Asn Glu His Cys Asp Thr Glu  
15 20 25

tgc	aaa	gcg	ccg	aac	caa	gga	ggt	agt	tac	ggc	tat	tgc	gac	act	ttt	145
Cys	Lys	Ala	Pro	Asn	Gln	Gly	Gly	Ser	Tyr	Gly	Tyr	Cys	Asp	Thr	Phe	
	30					35					40					

gag tgt tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tgg cct ctt 193  
Glu Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Trp Pro Leu  
45 50 55 60

cct aat aaa tca tgc ggc aaa aaa taatggcaac gtctttttat tgtccaccaa 247  
Pro Asn Lys Ser Cys Gly Lys Lys  
65

cagaaatatt gtaacgcttc ttaattg 274

<210> 82

<211> 72

<212> PRT

<213> Centruroides limpidus limpidus

<400> 82

Thr Val Ser Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asn Gly Cys  
-1 1 5 10

Lys Tyr Glu Cys Phe Lys Leu Gly Glu Asn Glu His Cys Asp Thr Glu  
15 20 25

Cys Lys Ala Pro Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Asp Thr Phe  
30 35 40

Glu Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Trp Pro Leu  
45                      50                      55                      60

Pro Asn Lys Ser Cys Gly Lys Lys  
65

<210> 83  
<211> 195  
<212> DNA  
<213> Centruroides limpidus limpidus  
  
<220>  
<221> CDS  
<222> (1)..(195)  
<223> Product= Sodium channel modifier toxin

<400> 83  
aaa gaa ggt tat ctg gtg aag aag agc aat ggt tgc aaa tac gag tgc 48  
Lys Glu Gly Tyr Leu Val Lys Lys Ser Asn Gly Cys Lys Tyr Glu Cys  
1 5 10 15  
  
ttt aaa ttg gga gaa aac gaa cac tgc gat acg gaa tgc aaa gcg ccg 96  
Phe Lys Leu Gly Glu Asn Glu His Cys Asp Thr Glu Cys Lys Ala Pro  
20 25 30  
  
aac caa gga ggt agt tac ggc tat tgc gac act ttt gag tgt tgg tgc 144  
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Asp Thr Phe Glu Cys Trp Cys  
35 40 45  
  
gaa ggt ttg ccc gaa agt aca ccg act tgg cct ctt cct aat aaa tca 192  
Glu Gly Leu Pro Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser  
50 55 60  
  
tgc 195  
Cys  
65

<210> 84  
<211> 65  
<212> PRT  
<213> Centruroides limpidus limpidus

<400> 84  
  
Lys Glu Gly Tyr Leu Val Lys Lys Ser Asn Gly Cys Lys Tyr Glu Cys  
1 5 10 15  
  
Phe Lys Leu Gly Glu Asn Glu His Cys Asp Thr Glu Cys Lys Ala Pro  
20 25 30  
  
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Asp Thr Phe Glu Cys Trp Cys  
35 40 45  
  
Glu Gly Leu Pro Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser  
50 55 60

Cys  
65

<210> 85  
<211> 323  
<212> DNA  
<213> Centruroides noxius

<220>  
<221> CDS  
<222> (5)..(265)  
<223> Product= Sodium channel modifier toxin precursor  
In the mature peptide, the last Asn is amidated, and the last Gly  
and the last basic aminoacid are cut

<220>  
<221> 3'UTR  
<222> (269)..(323)  
<223> 3'UTR

<220>  
<221> 5'UTR  
<222> (1)..(4)  
<223> 5'UTR

<220>  
<221> mat\_peptide  
<222> (62)..()  
<223> Product= Sodium channel modifier toxin

<220>  
<221> sig\_peptide  
<222> (5)..(61)  
<223> sig\_peptide

<400> 85  
gaag atg aac tcg ttg ttg atg atc act gct tgt ttg gcc ctg gtc gga 49  
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Val Gly  
-15 -10 -5  
  
aca gtg tgg tca aag gaa ggt tat ata gta aac tcg tac acg ggc tgc 97  
Thr Val Trp Ser Lys Glu Gly Tyr Ile Val Asn Ser Tyr Thr Gly Cys  
-1 1 5 10  
  
aaa tac gaa tgc ttg aaa ttg gga gac aac gat tat tgc ttg agg gaa 145  
Lys Tyr Glu Cys Leu Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu  
15 20 25  
  
tgc aaa cag cag tac gga aaa ggt gct ggc ggc tat tgt tac gct ttt 193  
Cys Lys Gln Gln Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe  
30 35 40  
  
ggg tgc tgg tgc aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt 241  
Gly Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu  
45 50 55 60



aaa aat aag aca tgc aac gga aaa taatggcaac gactttttat tgcccaccaa 295  
 Lys Asn Lys Thr Cys Asn Gly Lys  
 65

cagaaatatt gtaacgcttc ttaattgg 323

<210> 86  
 <211> 87  
 <212> PRT  
 <213> Centruroides noxius

<400> 86

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Val Gly Thr  
 -15 -10 -5

Val Trp Ser Lys Glu Gly Tyr Ile Val Asn Ser Tyr Thr Gly Cys Lys  
 -1 1 5 10

Tyr Glu Cys Leu Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys  
 15 20 25

Lys Gln Gln Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly  
 30 35 40 45

Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Lys  
 50 55 60

Asn Lys Thr Cys Asn Gly Lys  
 65

<210> 87  
 <211> 198  
 <212> DNA  
 <213> Centruroides noxius

<220>  
 <221> CDS  
 <222> (1)..(198)  
 <223> Product= Sodium channel modifier toxin

<400> 87  
 aag gaa ggt tat ata gta aac tcg tac acg ggc tgc aaa tac gaa tgc 48  
 Lys Glu Gly Tyr Ile Val Asn Ser Tyr Thr Gly Cys Lys Tyr Glu Cys  
 1 5 10 15

ttg aaa ttg gga gac aac gat tat tgc ttg agg gaa tgc aaa cag cag 96  
 Leu Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Gln Gln  
 20 25 30

```

tac gga aaa ggt gct ggc ggc tat tgt tac gct ttt ggg tgc tgg tgc      144
Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys
      35                      40                      45

```

```

aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt aaa aat aag aca      192
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Lys Asn Lys Thr
      50                      55                      60

```

```

tgc aac      198
Cys Asn
65

```

```

<210> 88
<211> 66
<212> PRT
<213> Centruroides noxius

```

```

<400> 88

```

```

Lys Glu Gly Tyr Ile Val Asn Ser Tyr Thr Gly Cys Lys Tyr Glu Cys
1              5              10              15

```

```

Leu Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Gln Gln
      20              25              30

```

```

Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys
      35              40              45

```

```

Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Lys Asn Lys Thr
      50              55              60

```

```

Cys Asn
65

```

```

<210> 89
<211> 323
<212> DNA
<213> Centruroides noxius

```

```

<220>
<221> CDS
<222> (5)..(265)
<223> Product= Sodium channel modifier toxin precursor
      In the mature peptide, the last Ser is amidated, and the last Gly
      and the last basic aminoacid are cut

```

```

<220>
<221> 3'UTR
<222> (269)..(323)
<223> 3'UTR

```

```

<220>

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<221> 5'UTR  
 <222> (1)..(4)  
 <223> 5'UTR

<220>  
 <221> mat\_peptide  
 <222> (62)..()  
 <223> Product= Sodium channel modifier toxin

<220>  
 <221> sig\_peptide  
 <222> (5)..(61)  
 <223> sig\_peptide

<400> 89  
 gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc ctg atc gga 49  
           Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly  
                                 -15                                -10                                -5

aca gtg tgc gca aag gaa ggt tat ctg gtg aac aaa agc aca ggc tgt 97  
 Thr Val Cys Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys  
                                 -1 1                                5                                10

aaa tac aac tgc ttg ata ttg gga gaa aac aaa aac tgc gat atg gaa 145  
 Lys Tyr Asn Cys Leu Ile Leu Gly Glu Asn Lys Asn Cys Asp Met Glu  
                                 15                                20                                25

tgc aaa gcg aag aac caa gga ggt agt tac ggc tat tgc tac gga ttt 193  
 Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe  
                                 30                                35                                40

ggg tgc tat tgt gaa gga ttg tcc gat agt aca ccg act tgg ccc ctt 241  
 Gly Cys Tyr Cys Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu  
 45                                50                                55                                60

cct aat aaa aca tgc agc gga aaa taatggcaac gacttttttat tgtccaccaa 295  
 Pro Asn Lys Thr Cys Ser Gly Lys  
                                 65

cagaaatagt gtaacgcttc ttaattgc 323

<210> 90  
 <211> 87  
 <212> PRT  
 <213> Centruroides noxius

<400> 90  
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly Thr  
                                 -15                                -10                                -5

Val Cys Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys  
                                 -1 1                                5                                10

Tyr Asn Cys Leu Ile Leu Gly Glu Asn Lys Asn Cys Asp Met Glu Cys

15

20

25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe Gly  
 30 35 40 45

Cys Tyr Cys Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Pro  
 50 55 60

Asn Lys Thr Cys Ser Gly Lys  
 65

&lt;210&gt; 91

&lt;211&gt; 198

&lt;212&gt; DNA

&lt;213&gt; Centruroides noxius

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(198)

&lt;223&gt; Product= Sodium channel modifier toxin

&lt;400&gt; 91

aag gaa ggt tat ctg gtg aac aaa agc aca ggc tgt aaa tac aac tgc 48  
 Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Asn Cys  
 1 5 10 15

ttg ata ttg gga gaa aac aaa aac tgc gat atg gaa tgc aaa gcg aag 96  
 Leu Ile Leu Gly Glu Asn Lys Asn Cys Asp Met Glu Cys Lys Ala Lys  
 20 25 30

aac caa gga ggt agt tac ggc tat tgc tac gga ttt ggg tgc tat tgt 144  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys  
 35 40 45

gaa gga ttg tcc gat agt aca ccg act tgg ccc ctt cct aat aaa aca 192  
 Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Thr  
 50 55 60

tgc agc 198  
 Cys Ser  
 65

&lt;210&gt; 92

&lt;211&gt; 66

&lt;212&gt; PRT

&lt;213&gt; Centruroides noxius

&lt;400&gt; 92

Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Asn Cys  
 1 5 10 15

Leu Ile Leu Gly Glu Asn Lys Asn Cys Asp Met Glu Cys Lys Ala Lys  
                   20                  25                  30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys  
           35                  40                  45

Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Thr  
       50                  55                  60

Cys Ser  
       65

<210> 93  
 <211> 323  
 <212> DNA  
 <213> Centruroides elegans

<220>  
 <221> CDS  
 <222> (5)..(265)  
 <223> Product= Sodium channel modifier toxin precursor  
       In the mature peptide, the last Asn is amidated, and the last Gly  
       and the last basic aminoacid are cut

<220>  
 <221> 3'UTR  
 <222> (269)..(323)  
 <223> 3'UTR

<220>  
 <221> 5'UTR  
 <222> (1)..(4)  
 <223> 5'UTR

<220>  
 <221> mat\_peptide  
 <222> (62)..()  
 <223> Product= Sodium channel modifier toxin

<220>  
 <221> sig\_peptide  
 <222> (5)..(67)  
 <223> sig\_peptide

<400> 93  
 gaag atg aac tcg ttg ttg atg atc act gct tgt ttg gcc ctg atc gga 49  
       Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Ile Gly  
                   -15                  -10                  -5

aca gtg tgg gca aag gaa ggt tat att gta aac tac cac gat ggc tgc 97  
 Thr Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr His Asp Gly Cys  
           -1 1                  5                  10

aaa tac gaa tgc tat aaa ttg gga gat aac gat tat tgc cta agg gaa 145  
 Lys Tyr Glu Cys Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu  
           15                          20                          25

tgc aaa ttg aga tac gga aaa ggt gct ggc ggc tat tgc tac gct ttt 193  
 Cys Lys Leu Arg Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe  
           30                          35                          40

ggg tgc tgg tgc aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt 241  
 Gly Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu  
           45                          50                          55                          60

cct aaa aaa aga tgc aat gga aaa taatggcaac gactttttat tgtccaccaa 295  
 Pro Lys Lys Arg Cys Asn Gly Lys  
                                   65

cagaaatatt gtaacgcttc ttaattgc 323

<210> 94  
 <211> 87  
 <212> PRT  
 <213> Centruroides elegans

<400> 94

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Ile Gly Thr  
                           -15                          -10                          -5

Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr His Asp Gly Cys Lys  
           -1  1                          5                          10

Tyr Glu Cys Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys  
           15                          20                          25

Lys Leu Arg Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly  
           30                          35                          40                          45

Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro  
                           50                          55                          60

Lys Lys Arg Cys Asn Gly Lys  
                           65

<210> 95  
 <211> 198  
 <212> DNA  
 <213> Centruroides elegans

<220>  
 <221> CDS  
 <222> (1)..(198)  
 <223> Product= Sodium channel modifier toxin

<400> 95  
aag gaa ggt tat att gta aac tac cac gat ggc tgc aaa tac gaa tgc 48  
Lys Glu Gly Tyr Ile Val Asn Tyr His Asp Gly Cys Lys Tyr Glu Cys  
1 5 10 15  
tat aaa ttg gga gat aac gat tat tgc cta agg gaa tgc aaa ttg aga 96  
Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg  
20 25 30  
tac gga aaa ggt gct ggc ggc tat tgc tac gct ttt ggg tgc tgg tgc 144  
Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys  
35 40 45  
aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt cct aaa aaa aga 192  
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Arg  
50 55 60  
tgc aat 198  
Cys Asn  
65

<210> 96  
<211> 66  
<212> PRT  
<213> Centruroides elegans

<400> 96  
Lys Glu Gly Tyr Ile Val Asn Tyr His Asp Gly Cys Lys Tyr Glu Cys  
1 5 10 15  
Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg  
20 25 30  
Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys  
35 40 45  
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Arg  
50 55 60  
Cys Asn  
65

<210> 97  
<211> 323  
<212> DNA  
<213> Centruroides elegans

<220>  
<221> CDS  
<222> (5) .. (265)

<223> Product= Sodium channel modifier toxin precursor  
In the mature peptide, the last 2 basic aminoacids are cut

<220>  
<221> 3'UTR  
<222> (269)..(323)  
<223> 3'UTR

<220>  
<221> 5'UTR  
<222> (1)..(4)  
<223> 5'UTR

<220>  
<221> mat\_peptide  
<222> (62)..()  
<223> Product= Sodium channel modifier toxin

<220>  
<221> sig\_peptide  
<222> (5)..(67)  
<223> sig\_peptide

<400> 97  
gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc cta ttc gga 49  
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly  
-15 -10 -5

aca gtg aaa gca aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc 97  
Thr Val Lys Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys  
-1 1 5 10

aaa tac ggt tgc ctc ttg tta aga aaa aac gaa ggc tgc gat aag gaa 145  
Lys Tyr Gly Cys Leu Leu Leu Arg Lys Asn Glu Gly Cys Asp Lys Glu  
15 20 25

tgc aaa gcg aag aac caa gga ggt agt tac ggc tat tgc tac tct ttt 193  
Cys Lys Ala Lys Asn Gln Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe  
30 35 40

gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt 241  
Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu  
45 50 55 60

cct aat aaa tca tgc agc aaa aaa taatggcaac gatttttttat tgtccaccaa 295  
Pro Asn Lys Ser Cys Ser Lys Lys  
65

cagaaatatt gtaacgcttc ttaatttc 323

<210> 98  
<211> 87  
<212> PRT  
<213> Centruroides elegans

<400> 98



Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly Thr  
                     -15                    -10                    -5

Val Lys Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys  
           -1  1                                  5                                  10

Tyr Gly Cys Leu Leu Leu Arg Lys Asn Glu Gly Cys Asp Lys Glu Cys  
       15                                  20                                  25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala  
   30                                  35                                  40                                  45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro  
                     50                    55                    60

Asn Lys Ser Cys Ser Lys Lys  
                     65

<210> 99

<211> 198

<212> DNA

<213> Centruroides elegans

<220>

<221> CDS

<222> (1)..(198)

<223> Product= Sodium channel modifier toxin

<400> 99

aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac ggt tgc 48  
 Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys  
 1                                  5                                  10                                  15

ctc ttg tta aga aaa aac gaa ggc tgc gat aag gaa tgc aaa gcg aag 96  
 Leu Leu Leu Arg Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys  
                     20                                  25                                  30

aac caa gga ggt agt tac ggc tat tgc tac tct ttt gca tgc tgg tgc 144  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys  
                     35                                  40                                  45

gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt cct aat aaa tca 192  
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
                     50                                  55                                  60

tgc agc 198  
 Cys Ser  
 65

<210> 100

<211> 66  
 <212> PRT  
 <213> *Centruroides elegans*

<400> 100

Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys  
 1 5 10 15

Leu Leu Leu Arg Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys  
 20 25 30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys  
 35 40 45

Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
 50 55 60

Cys Ser  
 65

<210> 101  
 <211> 323  
 <212> DNA  
 <213> *Centruroides elegans*

<220>  
 <221> CDS  
 <222> (5)..(265)  
 <223> Product= Sodium channel modifier toxin precursor  
 In the mature peptide, the last Cys is amidated, and the last Gly  
 and the last 2 basic aminoacids are cut

<220>  
 <221> 3'UTR  
 <222> (269)..(323)  
 <223> 3'UTR

<220>  
 <221> 5'UTR  
 <222> (1)..(4)  
 <223> 5'UTR

<220>  
 <221> mat\_peptide  
 <222> (62)..()  
 <223> Product= Sodium channel modifier toxin

<220>  
 <221> sig\_peptide  
 <222> (5)..(64)  
 <223> sig\_peptide

<400> 101  
gaag atg aat tcg ttg ttg atg atc act gct tgc ttg gtc ctg atc gga 49  
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly  
-15 -10 -5

aca gtg tgt gca aag gaa ggt tat ctg gta aac aag agc acg ggc tgc 97  
Thr Val Cys Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys  
-1 1 5 10

aaa tac agt tgc gtg tta ttg gga aaa aac gaa aac tgc gat aag gaa 145  
Lys Tyr Ser Cys Val Leu Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu  
15 20 25

tgc aaa gcg aag aac caa gga ggt agt tac ggc tat tgc tac gct ttt 193  
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe  
30 35 40

ggg tgc tgg tgt gaa gga ttg ccc gaa agt aca ccg act tat ccc att 241  
Gly Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile  
45 50 55 60

cct ggt aaa tca tgc ggc aga aaa taacggcaac gatattttat tgtttaccaa 295  
Pro Gly Lys Ser Cys Gly Arg Lys  
65

cagaaatatt gtaacgcttc ttaatttc 323

<210> 102  
<211> 87  
<212> PRT  
<213> Centruroides elegans

<400> 102  
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly Thr  
-15 -10 -5

Val Cys Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys  
-1 1 5 10

Tyr Ser Cys Val Leu Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu Cys  
15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly  
30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro  
50 55 60

Gly Lys Ser Cys Gly Arg Lys  
65

<210> 103  
 <211> 195  
 <212> DNA  
 <213> *Centruroides elegans*

<220>  
 <221> CDS  
 <222> (1)..(195)  
 <223> Product= Sodium channel modifier toxin

<400> 103  
 aag gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac agt tgc 48  
 Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Ser Cys  
 1 5 10 15  
 gtg tta ttg gga aaa aac gaa aac tgc gat aag gaa tgc aaa gcg aag 96  
 Val Leu Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu Cys Lys Ala Lys  
 20 25 30  
 aac caa gga ggt agt tac ggc tat tgc tac gct ttt ggg tgc tgg tgt 144  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys  
 35 40 45  
 gaa gga ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa tca 192  
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser  
 50 55 60  
 tgc 195  
 Cys  
 65

<210> 104  
 <211> 65  
 <212> PRT  
 <213> *Centruroides elegans*

<400> 104  
 Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Ser Cys  
 1 5 10 15  
 Val Leu Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu Cys Lys Ala Lys  
 20 25 30  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys  
 35 40 45  
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser  
 50 55 60  
 Cys  
 65

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<210> 105
<211> 323
<212> DNA
<213> Centruroides elegans

<220>
<221> CDS
<222> (5)..(265)
<223> Product= Sodium channel modifier toxin precursor
      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

<220>
<221> 3'UTR
<222> (269)..(323)
<223> 3'UTR

<220>
<221> 5'UTR
<222> (1)..(4)
<223> 5'UTR

<220>
<221> mat_peptide
<222> (62)..()
<223> Product= Sodium channel modifier toxin Ce6b

<220>
<221> sig_peptide
<222> (5)..(64)
<223> sig_peptide

<400> 105
gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc ctg atc gga      49
      Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly
              -15                      -10                      -5

aca gtt tgc gca aag gat ggt tat ctg gta aac aag agc acg ggc tgc      97
Thr Val Cys Ala Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
      -1  1                      5                      10

aaa tac agt tgc ggg aaa ttg gga gaa aac gaa cac tgc gat aag gaa      145
Lys Tyr Ser Cys Gly Lys Leu Gly Glu Asn Glu His Cys Asp Lys Glu
      15                      20                      25

tgc aaa gcg aag aac caa gga ggt agt tac ggc tat tgc tat gct ttt      193
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe
      30                      35                      40

ggg tgc tgg tgt gaa gga ttg ccc gaa agt acc ccg act tat ccc att      241
Gly Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile
      45                      50                      55                      60

cct ggt aaa tca tgc ggc aga aaa taacggcaac gatattttat tgtttaccaa      295
Pro Gly Lys Ser Cys Gly Arg Lys

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65

cagaaatatt gtaacgcttc ttaattgc

323

<210> 106  
 <211> 87  
 <212> PRT  
 <213> Centruroides elegans

&lt;400&gt; 106

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly Thr  
                     -15                    -10                    -5

Val Cys Ala Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys  
           -1  1                    5                    10

Tyr Ser Cys Gly Lys Leu Gly Glu Asn Glu His Cys Asp Lys Glu Cys  
       15                    20                    25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly  
   30                    35                    40                    45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro  
                     50                    55                    60

Gly Lys Ser Cys Gly Arg Lys  
                     65

<210> 107  
 <211> 195  
 <212> DNA  
 <213> Centruroides elegans

<220>  
 <221> CDS  
 <222> (1)..(195)  
 <223> Product= Sodium channel modifier toxin

<400> 107  
 aag gat ggt tat ctg gta aac aag agc acg ggc tgc aaa tac agt tgc 48  
 Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Ser Cys  
 1                    5                    10                    15

ggg aaa ttg gga gaa aac gaa cac tgc gat aag gaa tgc aaa gcg aag 96  
 Gly Lys Leu Gly Glu Asn Glu His Cys Asp Lys Glu Cys Lys Ala Lys  
                     20                    25                    30

aac caa gga ggt agt tac ggc tat tgc tat gct ttt ggg tgc tgg tgt 144  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys  
                     35                    40                    45

gaa gga ttg ccc gaa agt acc ccg act tat ccc att cct ggt aaa tca 192  
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser  
     50                    55                    60

tgc 195  
 Cys  
 65

<210> 108  
 <211> 65  
 <212> PRT  
 <213> Centruroides elegans  
 <400> 108

Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Ser Cys  
     1                    5                    10                    15

Gly Lys Leu Gly Glu Asn Glu His Cys Asp Lys Glu Cys Lys Ala Lys  
             20                    25                    30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys  
             35                    40                    45

Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser  
     50                    55                    60

Cys  
 65

<210> 109  
 <211> 311  
 <212> DNA  
 <213> Centruroides elegans  
 <220>  
 <221> CDS  
 <222> (5)..(256)  
 <223> Product= Sodium channel modifier toxin precursor  
       In the mature peptide, the last Cys is amidated, and the last Gly  
       and the last 2 basic aminoacids are cut

<220>  
 <221> 3'UTR  
 <222> (260)..(311)  
 <223> 3'UTR

<220>  
 <221> 5'UTR  
 <222> (1)..(4)  
 <223> 5'UTR

<220>  
 <221> mat\_peptide  
 <222> (62)..()  
 <223> Product= Sodium channel modifier toxin

<220>  
 <221> sig\_peptide  
 <222> (5)..(58)  
 <223> sig\_peptide

<400> 109  
 gaag atg aat tgc ttg ttg atg atc act gct tgt ttg gtc cta ttc gga 49  
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly  
 -15 -10 -5

aat gtg tgg gca aag gac ggt tat ctg gtg aac aag acg ggc tgc aaa 97  
 Asn Val Trp Ala Lys Asp Gly Tyr Leu Val Asn Lys Thr Gly Cys Lys  
 -1 1 5 10

tac aat tgc tgg ata ttg gga gaa aac aaa tac tgc aat tgc gaa tgc 145  
 Tyr Asn Cys Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Ser Glu Cys  
 15 20 25

aaa gag gta ggt gct ggt tac ggc tat tgc tat gct ttt ggg tgc tat 193  
 Lys Glu Val Gly Ala Gly Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Tyr  
 30 35 40

tgc gaa gga tta ccc gaa agc gta ctg acc tgg ccc ctt tct gat aaa 241  
 Cys Glu Gly Leu Pro Glu Ser Val Leu Thr Trp Pro Leu Ser Asp Lys  
 45 50 55 60

aca tgc ggc aga aaa taatggcaac gtctttttat tgtccaccaa cagaaatatt 296  
 Thr Cys Gly Arg Lys  
 65

gtaacgcttc ttaat 311

<210> 110  
 <211> 84  
 <212> PRT  
 <213> Centruroides elegans

<400> 110  
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly Asn  
 -15 -10 -5

Val Trp Ala Lys Asp Gly Tyr Leu Val Asn Lys Thr Gly Cys Lys Tyr  
 -1 1 5 10

Asn Cys Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Ser Glu Cys Lys  
 15 20 25



Glu Val Gly Ala Gly Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Tyr Cys  
 30 35 40 45

Glu Gly Leu Pro Glu Ser Val Leu Thr Trp Pro Leu Ser Asp Lys Thr  
 50 55 60

Cys Gly Arg Lys  
 65

<210> 111  
 <211> 186  
 <212> DNA  
 <213> *Centruroides elegans*

<220>  
 <221> CDS  
 <222> (1)..(186)  
 <223> Product= Sodium channel modifier toxin

<400> 111  
 aag gac ggt tat ctg gtg aac aag acg ggc tgc aaa tac aat tgc tgg 48  
 Lys Asp Gly Tyr Leu Val Asn Lys Thr Gly Cys Lys Tyr Asn Cys Trp  
 1 5 10 15  
 ata ttg gga gaa aac aaa tac tgc aat tcg gaa tgc aaa gag gta ggt 96  
 Ile Leu Gly Glu Asn Lys Tyr Cys Asn Ser Glu Cys Lys Glu Val Gly  
 20 25 30  
 gct ggt tac ggc tat tgc tat gct ttt ggg tgc tat tgc gaa gga tta 144  
 Ala Gly Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Tyr Cys Glu Gly Leu  
 35 40 45  
 ccc gaa agc gta ctg acc tgg ccc ctt tct gat aaa aca tgc 186  
 Pro Glu Ser Val Leu Thr Trp Pro Leu Ser Asp Lys Thr Cys  
 50 55 60

<210> 112  
 <211> 62  
 <212> PRT  
 <213> *Centruroides elegans*

<400> 112  
 Lys Asp Gly Tyr Leu Val Asn Lys Thr Gly Cys Lys Tyr Asn Cys Trp  
 1 5 10 15  
 Ile Leu Gly Glu Asn Lys Tyr Cys Asn Ser Glu Cys Lys Glu Val Gly  
 20 25 30  
 Ala Gly Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Tyr Cys Glu Gly Leu  
 35 40 45

Pro Glu Ser Val Leu Thr Trp Pro Leu Ser Asp Lys Thr Cys  
 50 55 60

<210> 113  
 <211> 323  
 <212> DNA  
 <213> Centruroides elegans

<220>  
 <221> CDS  
 <222> (5)..(265)  
 <223> Product= Sodium channel modifier toxin precursor  
 In the mature peptide, the last Cys is amidated, and the last Gly  
 and the last 2 basic aminoacids are cut

<220>  
 <221> 3'UTR  
 <222> (269)..(323)  
 <223> 3'UTR

<220>  
 <221> 5'UTR  
 <222> (1)..(4)  
 <223> 5'UTR

<220>  
 <221> mat\_peptide  
 <222> (65)..()  
 <223> Product= Sodium channel modifier toxin

<220>  
 <221> sig\_peptide  
 <222> (5)..(64)  
 <223> sig\_peptide

<400> 113  
 gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc atg ttc gga 49  
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Met Phe Gly  
 -20 -15 -10

aca gtg tgg gca aaa aaa gac ggt tat ctg gtg gac aag acg ggc tgc 97  
 Thr Val Trp Ala Lys Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys  
 -5 -1 1 5 10

aaa tac act tgc tgg ata ttg gga gaa aac aaa tac tgc aat agg gaa 145  
 Lys Tyr Thr Cys Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu  
 15 20 25

tgc aca tgg aag cac cga gga ggt aat tac ggc tat tgc tac gga ttt 193  
 Cys Thr Trp Lys His Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe  
 30 35 40

ggg tgc tat tgc gaa gga ttg tcc gat agt aca ccg act tgg ccc ctt 241  
 Gly Cys Tyr Cys Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu  
 45 50 55

tct aat aaa aga tgc ggc aaa aaa taatggcaac gactttttat tgtccaccaa 295  
 Ser Asn Lys Arg Cys Gly Lys Lys  
 60 65

cagaaatatt gtaacgcttc ttaattgc 323

<210> 114  
 <211> 87  
 <212> PRT  
 <213> *Centruroides elegans*

<400> 114

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Met Phe Gly Thr  
 -20 -15 -10 -5

Val Trp Ala Lys Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys Lys  
 -1 1 5 10

Tyr Thr Cys Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu Cys  
 15 20 25

Thr Trp Lys His Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe Gly  
 30 35 40

Cys Tyr Cys Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Ser  
 45 50 55 60

Asn Lys Arg Cys Gly Lys Lys  
 65

<210> 115  
 <211> 192  
 <212> DNA  
 <213> *Centruroides elegans*

<220>  
 <221> CDS  
 <222> (1)..(192)  
 <223> Product= Sodium channel modifier toxin

<400> 115  
 aaa gac ggt tat ctg gtg gac aag acg ggc tgc aaa tac act tgc tgg 48  
 Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys Lys Tyr Thr Cys Trp  
 1 5 10 15

ata ttg gga gaa aac aaa tac tgc aat agg gaa tgc aca tgg aag cac 96  
 Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu Cys Thr Trp Lys His  
 20 25 30

```

cga gga ggt aat tac ggc tat tgc tac gga ttt ggg tgc tat tgc gaa      144
Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu
      35                      40                      45

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gga ttg tcc gat agt aca ccg act tgg ccc ctt tct aat aaa aga tgc      192
Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Ser Asn Lys Arg Cys
      50                      55                      60

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```

<210> 116
<211> 64
<212> PRT
<213> Centruroides elegans

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```

<400> 116

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```

Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys Lys Tyr Thr Cys Trp
1              5              10              15

```

```

Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu Cys Thr Trp Lys His
      20              25              30

```

```

Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu
      35              40              45

```

```

Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Ser Asn Lys Arg Cys
      50              55              60

```

```

<210> 117
<211> 323
<212> DNA
<213> Centruroides elegans

```

```

<220>
<221> CDS
<222> (5)..(265)
<223> Product= Sodium channel modifier toxin precursor
      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

```

```

<220>
<221> 3'UTR
<222> (269)..(323)
<223> 3'UTR

```

```

<220>
<221> 5'UTR
<222> (1)..(4)
<223> 5'UTR

```

```

<220>
<221> mat_peptide
<222> (65)..()
<223> Product= Sodium channel modifier toxin

```

```

<220>
<221>  sig_peptide
<222>  (5)..(64)
<223>  sig_peptide

<400>  117
gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc atg ttc gga      49
  Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Met Phe Gly
    -20                -15                -10

aca gtg tgg gca aaa aaa gac ggt tat ctg gtg gac aag acg ggc tgc      97
Thr Val Trp Ala Lys Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys
  -5                -1  1                5                10

aaa tac act tgc tgg ata ttg gga gaa aac aaa tac tgc aat agg gaa      145
Lys Tyr Thr Cys Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu
          15                20                25

tgc aca tgg aag cac cga gga ggt aat tac ggc tat tgc tac gga ttt      193
Cys Thr Trp Lys His Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe
      30                35                40

ggg tgc tat tgc gaa gga ttg tcc gat agt aca ccg act tgg ccc ctt      241
Gly Cys Tyr Cys Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu
      45                50                55

cct aat aaa aga tgc ggc aaa aaa taatggcaac gacttttttat tgtccaccaa      295
Pro Asn Lys Arg Cys Gly Lys Lys
  60                65

cagaaatagt gtaacgcttc ttaattgc      323

<210>  118
<211>  87
<212>  PRT
<213>  Centruroides elegans

<400>  118

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Met Phe Gly Thr
-20                -15                -10                -5

Val Trp Ala Lys Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys Lys
      -1  1                5                10

Tyr Thr Cys Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu Cys
      15                20                25

Thr Trp Lys His Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe Gly
      30                35                40

Cys Tyr Cys Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Pro

```

45

50

55

60

Asn Lys Arg Cys Gly Lys Lys  
65

&lt;210&gt; 119

&lt;211&gt; 192

&lt;212&gt; DNA

&lt;213&gt; Centruroides elegans

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(192)

&lt;223&gt; Product= Sodium channel modifier toxin

&lt;400&gt; 119

aaa gac ggt tat ctg gtg gac aag acg ggc tgc aaa tac act tgc tgg 48  
Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys Lys Tyr Thr Cys Trp  
1 5 10 15

ata ttg gga gaa aac aaa tac tgc aat agg gaa tgc aca tgg aag cac 96  
Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu Cys Thr Trp Lys His  
20 25 30

cga gga ggt aat tac ggc tat tgc tac gga ttt ggg tgc tat tgc gaa 144  
Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu  
35 40 45

gga ttg tcc gat agt aca ccg act tgg ccc ctt cct aat aaa aga tgc 192  
Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Arg Cys  
50 55 60

&lt;210&gt; 120

&lt;211&gt; 64

&lt;212&gt; PRT

&lt;213&gt; Centruroides elegans

&lt;400&gt; 120

Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys Lys Tyr Thr Cys Trp  
1 5 10 15

Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu Cys Thr Trp Lys His  
20 25 30

Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu  
35 40 45

Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Arg Cys  
50 55 60

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<210> 121
<211> 323
<212> DNA
<213> Centruroides gracilis

<220>
<221> CDS
<222> (5)..(265)
<223> Product= Sodium channel modifier toxin precursor
      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

<220>
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<223> 5'UTR

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<220>
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<400> 121
gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc ctg atc gga      49
      Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly
              -15                      -10                      -5

acc gtg tgg gca aag gac ggt tat ctg gtg aag aag agc gac ggc tgc      97
Thr Val Trp Ala Lys Asp Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys
      -1  1                      5                      10

aaa tac ggt tgc atg ctc aag ata gga gac gct ggc tgt gat aag gaa      145
Lys Tyr Gly Cys Met Leu Lys Ile Gly Asp Ala Gly Cys Asp Lys Glu
      15                      20                      25

tgc aaa gcg ccg aac caa gga ggt agt tac ggc tat tgc tac ctt ctt      193
Cys Lys Ala Pro Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu
      30                      35                      40

ggg tgc tgg tgc gaa ggt atg cct gaa agt aca ccg act tat ccc ctt      241
Gly Cys Trp Cys Glu Gly Met Pro Glu Ser Thr Pro Thr Tyr Pro Leu
      45                      50                      55                      60

cct ggt aaa tca tgc ggc aaa aaa taatggcaac gtcttttttat tgtccactaa      295
Pro Gly Lys Ser Cys Gly Lys Lys
              65

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gaa ggt atg cct gaa agt aca ccg act tat ccc ctt cct ggt aaa tca 192



Glu Gly Met Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Gly Lys Ser  
 50 55 60

tgc 195  
 Cys  
 65

<210> 124  
 <211> 65  
 <212> PRT  
 <213> *Centruroides gracilis*

<400> 124

Lys Asp Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Gly Cys  
 1 5 10 15

Met Leu Lys Ile Gly Asp Ala Gly Cys Asp Lys Glu Cys Lys Ala Pro  
 20 25 30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu Gly Cys Trp Cys  
 35 40 45

Glu Gly Met Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Gly Lys Ser  
 50 55 60

Cys  
 65

<210> 125  
 <211> 323  
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 <213> *Centruroides gracilis*

<220>  
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 <222> (5)..(265)  
 <223> Product= Sodium channel modifier toxin precursor  
 In the mature peptide, the last Cys is amidated, and the last Gly  
 and the last 2 basic aminoacids are cut

<220>  
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<400> 125  
 gaag atg aac tcg ttg ttg atg atc act gct tgt ttg gtc ctg atc gga 49  
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly  
 -15 -10 -5  
 acc gtg tgg gca aag gac ggt tat ctg gtg aag gag agc gac ggc tgc 97  
 Thr Val Trp Ala Lys Asp Gly Tyr Leu Val Lys Glu Ser Asp Gly Cys  
 -1 1 5 10  
 aaa tac ggt tgc atg ctc aag ata gga gac gct ggc tgt gat aag gaa 145  
 Lys Tyr Gly Cys Met Leu Lys Ile Gly Asp Ala Gly Cys Asp Lys Glu  
 15 20 25  
 tgc aaa gcg ccg aac caa gga ggt agt tac ggc tat tgc tac ctt ctt 193  
 Cys Lys Ala Pro Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu  
 30 35 40  
 ggg tgc tgg tgc gaa ggt atg cct gaa agt aca ccg act tat ccc ctt 241  
 Gly Cys Trp Cys Glu Gly Met Pro Glu Ser Thr Pro Thr Tyr Pro Leu  
 45 50 55 60  
 cct ggt aaa tca tgc ggc aaa aaa taatggcaac gtcttttttat tgtccactaa 295  
 Pro Gly Lys Ser Cys Gly Lys Lys  
 65  
 cagaaatatt gtaacgcttc ttaattgc 323

<210> 126  
 <211> 87  
 <212> PRT  
 <213> Centruroides gracilis

<400> 126  
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly Thr  
 -15 -10 -5  
 Val Trp Ala Lys Asp Gly Tyr Leu Val Lys Glu Ser Asp Gly Cys Lys  
 -1 1 5 10  
 Tyr Gly Cys Met Leu Lys Ile Gly Asp Ala Gly Cys Asp Lys Glu Cys  
 15 20 25  
 Lys Ala Pro Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu Gly  
 30 35 40 45

Cys Trp Cys Glu Gly Met Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro  
                     50                    55                    60

Gly Lys Ser Cys Gly Lys Lys  
                     65

<210> 127  
 <211> 195  
 <212> DNA  
 <213> *Centruroides gracilis*

<220>  
 <221> CDS  
 <222> (1)..(195)  
 <223> Product= Sodium channel modifier toxin

<400> 127  
 aag gac ggt tat ctg gtg aag gag agc gac ggc tgc aaa tac ggt tgc 48  
 Lys Asp Gly Tyr Leu Val Lys Glu Ser Asp Gly Cys Lys Tyr Gly Cys  
 1                    5                    10                    15

atg ctc aag ata gga gac gct ggc tgt gat aag gaa tgc aaa gcg ccg 96  
 Met Leu Lys Ile Gly Asp Ala Gly Cys Asp Lys Glu Cys Lys Ala Pro  
                     20                    25                    30

aac caa gga ggt agt tac ggc tat tgc tac ctt ctt ggg tgc tgg tgc 144  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu Gly Cys Trp Cys  
                     35                    40                    45

gaa ggt atg cct gaa agt aca ccg act tat ccc ctt cct ggt aaa tca 192  
 Glu Gly Met Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Gly Lys Ser  
                     50                    55                    60

tgc 195  
 Cys  
 65

<210> 128  
 <211> 65  
 <212> PRT  
 <213> *Centruroides gracilis*

<400> 128

Lys Asp Gly Tyr Leu Val Lys Glu Ser Asp Gly Cys Lys Tyr Gly Cys  
 1                    5                    10                    15

Met Leu Lys Ile Gly Asp Ala Gly Cys Asp Lys Glu Cys Lys Ala Pro  
                     20                    25                    30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu Gly Cys Trp Cys

35

40

45

Glu Gly Met Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Gly Lys Ser  
 50 55 60

Cys  
 65

<210> 129  
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 <213> *Centruroides gracilis*

<220>  
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 <222> (5)..(265)  
 <223> Product= Sodium channel modifier toxin precursor

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 <222> (62)..()  
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<400> 129  
 gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc ctg atc gga 49  
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly  
 -15 -10 -5

acg gtg tgg gca aag gac ggt tat ctg gtg aac aag agc acg ggc tgc 97  
 Thr Val Trp Ala Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys  
 -1 1 5 10

aaa tac agt tgc ata gaa aat ata aac gac agt cac tgc aat gag gaa 145  
 Lys Tyr Ser Cys Ile Glu Asn Ile Asn Asp Ser His Cys Asn Glu Glu  
 15 20 25

tgt ata tcg tcg atc cgc aaa ggt agt tac ggc tat tgc tac aaa ttt 193  
 Cys Ile Ser Ser Ile Arg Lys Gly Ser Tyr Gly Tyr Cys Tyr Lys Phe  
 30 35 40

tac tgt tat tgc ata ggt atg ccc gat agt aca cag gtt tat cct att 241  
 Tyr Cys Tyr Cys Ile Gly Met Pro Asp Ser Thr Gln Val Tyr Pro Ile  
 45 50 55 60

cct ggt aaa act tgc agc aca gaa taatggcaac gtcttttttat tgtccaccaa 295  
 Pro Gly Lys Thr Cys Ser Thr Glu  
 65

cagaaatatt gtaacgcttc ttaattgc 323

<210> 130  
 <211> 87  
 <212> PRT  
 <213> *Centruroides gracilis*

<400> 130

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly Thr  
 -15 -10 -5

Val Trp Ala Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys  
 -1 1 5 10

Tyr Ser Cys Ile Glu Asn Ile Asn Asp Ser His Cys Asn Glu Glu Cys  
 15 20 25

Ile Ser Ser Ile Arg Lys Gly Ser Tyr Gly Tyr Cys Tyr Lys Phe Tyr  
 30 35 40 45

Cys Tyr Cys Ile Gly Met Pro Asp Ser Thr Gln Val Tyr Pro Ile Pro  
 50 55 60

Gly Lys Thr Cys Ser Thr Glu  
 65

<210> 131  
 <211> 204  
 <212> DNA  
 <213> *Centruroides gracilis*

<220>  
 <221> CDS  
 <222> (1)..(204)  
 <223> Product= Sodium channel modifier toxin

<400> 131  
 aag gac ggt tat ctg gtg aac aag agc acg ggc tgc aaa tac agt tgc 48  
 Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Ser Cys  
 1 5 10 15

ata gaa aat ata aac gac agt cac tgc aat gag gaa tgt ata tcg tcg 96  
 Ile Glu Asn Ile Asn Asp Ser His Cys Asn Glu Glu Cys Ile Ser Ser  
           20                          25                          30

atc cgc aaa ggt agt tac ggc tat tgc tac aaa ttt tac tgt tat tgc 144  
 Ile Arg Lys Gly Ser Tyr Gly Tyr Cys Tyr Lys Phe Tyr Cys Tyr Cys  
           35                          40                          45

ata ggt atg ccc gat agt aca cag gtt tat cct att cct ggt aaa act 192  
 Ile Gly Met Pro Asp Ser Thr Gln Val Tyr Pro Ile Pro Gly Lys Thr  
           50                          55                          60

tgc agc aca gaa 204  
 Cys Ser Thr Glu  
 65

<210> 132  
 <211> 68  
 <212> PRT  
 <213> Centruroides gracilis

<400> 132

Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Ser Cys  
 1                          5                          10                          15

Ile Glu Asn Ile Asn Asp Ser His Cys Asn Glu Glu Cys Ile Ser Ser  
           20                          25                          30

Ile Arg Lys Gly Ser Tyr Gly Tyr Cys Tyr Lys Phe Tyr Cys Tyr Cys  
           35                          40                          45

Ile Gly Met Pro Asp Ser Thr Gln Val Tyr Pro Ile Pro Gly Lys Thr  
           50                          55                          60

Cys Ser Thr Glu  
 65

<210> 133  
 <211> 323  
 <212> DNA  
 <213> Centruroides gracilis

<220>  
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 <222> (5)..(265)  
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           and the last 2 basic aminoacids are cut

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<400> 133

gaag atg aac tcg ttg ttg atg atc act gct tgt ttg gtc ctg atc gga 49

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly  
-15 -10 -5

acc gtg tgg aca aag gac ggt tat ctg gtg aag aag agc gac ggc tgc 97

Thr Val Trp Thr Lys Asp Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys  
-1 1 5 10

aaa tac ggt tgc gta atg ttg gtc gga gac agt ggc tgc gat acg gaa 145

Lys Tyr Gly Cys Val Met Leu Val Gly Asp Ser Gly Cys Asp Thr Glu  
15 20 25

tgc aaa gcg aag aat caa ggt ggt aaa aaa gga tgg tgc tac gcc ttt 193

Cys Lys Ala Lys Asn Gln Gly Gly Lys Lys Gly Trp Cys Tyr Ala Phe  
30 35 40

ggg tgc tgg tgc aca ggt atg ccc gac agt aca cag gtt tat ccc ctt 241

Gly Cys Trp Cys Thr Gly Met Pro Asp Ser Thr Gln Val Tyr Pro Leu  
45 50 55 60

cct gat aaa tca tgc ggc aaa aaa taatggcaac gtcttttttat tgtccaccaa 295

Pro Asp Lys Ser Cys Gly Lys Lys  
65

cagaaatagt gtaacgcttc ttaattgc 323

<210> 134

<211> 87

<212> PRT

<213> Centruroides gracilis

<400> 134

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly Thr

-15 -10 -5

Val Trp Thr Lys Asp Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys

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-1  1                      5                      10

Tyr Gly Cys Val Met Leu Val Gly Asp Ser Gly Cys Asp Thr Glu Cys
 15                      20                      25

Lys Ala Lys Asn Gln Gly Gly Lys Lys Gly Trp Cys Tyr Ala Phe Gly
30                      35                      40                      45

Cys Trp Cys Thr Gly Met Pro Asp Ser Thr Gln Val Tyr Pro Leu Pro
                    50                      55                      60

Asp Lys Ser Cys Gly Lys Lys
                65

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<210> 135
<211> 195
<212> DNA
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<220>
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<223> Product= Sodium channel modifier toxin

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<400> 135
aag gac ggt tat ctg gtg aag aag agc gac ggc tgc aaa tac ggt tgc      48
Lys Asp Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Gly Cys
1                      5                      10                      15

gta atg ttg gtc gga gac agt ggc tgc gat acg gaa tgc aaa gcg aag      96
Val Met Leu Val Gly Asp Ser Gly Cys Asp Thr Glu Cys Lys Ala Lys
                20                      25                      30

aat caa ggt ggt aaa aaa gga tgg tgc tac gcc ttt ggg tgc tgg tgc      144
Asn Gln Gly Gly Lys Lys Gly Trp Cys Tyr Ala Phe Gly Cys Trp Cys
                35                      40                      45

aca ggt atg ccc gac agt aca cag gtt tat ccc ctt cct gat aaa tca      192
Thr Gly Met Pro Asp Ser Thr Gln Val Tyr Pro Leu Pro Asp Lys Ser
                50                      55                      60

tgc      195
Cys

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<210> 136
<211> 65
<212> PRT
<213> Centruroides gracilis

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<400> 136

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Lys Asp Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Gly Cys

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<210> 137
<211> 323
<212> DNA
<213> Centruroides sculpturatus

<220>
<221> CDS
<222> (5)..(265)
<223> Product= Sodium channel modifier toxin precursor
In the mature peptide, the last Cys is amidated, and the last Gly
and the last 2 basic aminoacids are cut

<220>
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<300>
<301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus
Ewing, that recognize Na+ channels
<303> Toxicon
<304> 39

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<305> 12  
 <306> 1893-1898  
 <307> 2001-12-01  
 <309>  
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<400> 137

gaag atg aat tcg ttg ttg atc atc act gtt tgt ttg ttc ctg atc gga 49  
 Met Asn Ser Leu Leu Ile Ile Thr Val Cys Leu Phe Leu Ile Gly  
 -15 -10 -5

acc gtg tgg gca aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc 97  
 Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys  
 -1 1 5 10

aaa tac gat tgc ttt tgg ttg gga aaa aac gaa cac tgc gat ttg gaa 145  
 Lys Tyr Asp Cys Phe Trp Leu Gly Lys Asn Glu His Cys Asp Leu Glu  
 15 20 25

tgc aaa gcg aag aac caa gga ggt agt tac ggg tat tgc tac gct ttc 193  
 Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe  
 30 35 40

gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt 241  
 Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu  
 45 50 55 60

cct aat aaa tca tgc ggc aaa aaa taatagcaac aacttttttat tgtccaccaa 295  
 Pro Asn Lys Ser Cys Gly Lys Lys  
 65

cagaaatatt gtaacgcttc ttaattgc 323

<210> 138

<211> 87

<212> PRT

<213> *Centruroides sculpturatus*

<400> 138

Met Asn Ser Leu Leu Ile Ile Thr Val Cys Leu Phe Leu Ile Gly Thr  
 -15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys  
 -1 1 5 10

Tyr Asp Cys Phe Trp Leu Gly Lys Asn Glu His Cys Asp Leu Glu Cys  
 15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala  
 30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro  
 50 55 60

Asn Lys Ser Cys Gly Lys Lys  
65

<210> 139  
<211> 195  
<212> DNA  
<213> Centruroides sculpturatus

<220>  
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<223> Product= Sodium channel modifier toxin

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Ewing, that recognize Na<sup>+</sup> channels  
<303> Toxicon  
<304> 39  
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<307> 2001-12-01  
<309>  
<313> (1)..(195)

<400> 139  
aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac gat tgc 48  
Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Asp Cys  
1 5 10 15

ttt tgg ttg gga aaa aac gaa cac tgc gat ttg gaa tgc aaa gcg aag 96  
Phe Trp Leu Gly Lys Asn Glu His Cys Asp Leu Glu Cys Lys Ala Lys  
20 25 30

aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc 144  
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys  
35 40 45

gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt cct aat aaa tca 192  
Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
50 55 60

tgc 195  
Cys  
65

<210> 140  
<211> 65  
<212> PRT  
<213> Centruroides sculpturatus

<400> 140

Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Asp Cys

```

<210> 141
<211> 323
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<220>
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      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

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<220>
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<223> Product= Sodium channel modifier toxin
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<302> Genes and peptides from the scorpion Centruroides sculpturatus
Ewing, that recognize Na+ channels
<303> Toxicon
<304> 39

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<305> 12  
 <306> 1893-1898  
 <307> 2001-12-01  
 <309>  
 <313> (5) .. (265)

<400> 141

gaag atg aat tcg ttg ttg atg atc act gct tgt ttc gcc ctg gtc gga 49  
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Phe Ala Leu Val Gly  
 -15 -10 -5

aca gtg tgg gca aag gaa ggt tat ctg gtg aag aag agc gat ggc tgc 97  
 Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys  
 -1 1 5 10

aaa tac gat tgc ttt tgg ttg gga aaa aac gaa cac tgc gat ttg gaa 145  
 Lys Tyr Asp Cys Phe Trp Leu Gly Lys Asn Glu His Cys Asp Leu Glu  
 15 20 25

tgc aaa gcg aag aac caa gga ggt agt tac ggg tat tgc tac gct ttc 193  
 Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe  
 30 35 40

gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt 241  
 Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu  
 45 50 55 60

cct aat aaa tca tgc ggc aaa aaa taatagcaac aacttttttat tgtccaccaa 295  
 Pro Asn Lys Ser Cys Gly Lys Lys  
 65

cagaaatagt gtaacgcttc ttaattgc 323

<210> 142

<211> 87

<212> PRT

<213> *Centruroides sculpturatus*

<400> 142

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Phe Ala Leu Val Gly Thr  
 -15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys  
 -1 1 5 10

Tyr Asp Cys Phe Trp Leu Gly Lys Asn Glu His Cys Asp Leu Glu Cys  
 15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala  
 30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro  
 50 55 60

Asn Lys Ser Cys Gly Lys Lys  
65

<210> 143  
<211> 195  
<212> DNA  
<213> Centruroides sculpturatus

<220>  
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Ewing, that recognize Na<sup>+</sup> channels  
<303> Toxicon  
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<307> 2001-12-01  
<309>  
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<400> 143  
aag gaa ggt tat ctg gtg aag aag agc gat ggc tgc aaa tac gat tgc 48  
Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Asp Cys  
1 5 10 15  
  
ttt tgg ttg gga aaa aac gaa cac tgc gat ttg gaa tgc aaa gcg aag 96  
Phe Trp Leu Gly Lys Asn Glu His Cys Asp Leu Glu Cys Lys Ala Lys  
20 25 30  
  
aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc 144  
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys  
35 40 45  
  
gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt cct aat aaa tca 192  
Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
50 55 60  
  
tgc 195  
Cys  
65

<210> 144  
<211> 65  
<212> PRT  
<213> Centruroides sculpturatus

<400> 144

Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Asp Cys

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<210> 145
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<213> Centruroides sculpturatus

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In the mature peptide, the last Cys is amidated, and the last Gly
and the last 2 basic aminoacids are cut

<220>
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<223> 3'UTR

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<222> (1)..(4)
<223> 5'UTR

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<301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus
Ewing, that recognize Na+ channels
<303> Toxicon
<304> 39

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<305> 12  
 <306> 1893-1898  
 <307> 2001-12-01  
 <309>  
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<400> 145  
 gaag atg aac tcg ttg ttg atg atc act gct tgt ttg ttc ctg atc gga 49  
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Phe Leu Ile Gly  
 -15 -10 -5

acc gtg tgg gca aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc 97  
 Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys  
 -1 1 5 10

aaa tac ggt tgc ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa 145  
 Lys Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu  
 15 20 25

tgc aaa gcg aag aac caa gga ggt agt tac ggg tat tgc tac gct ttc 193  
 Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe  
 30 35 40

gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt 241  
 Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu  
 45 50 55 60

cct aat aaa tca tgc ggc aaa aaa taatagcaac aacttttttat tgtccaccaa 295  
 Pro Asn Lys Ser Cys Gly Lys Lys  
 65

cagaaatatt gtaacgcttc ttaattgc 323

<210> 146  
 <211> 87  
 <212> PRT  
 <213> Centruroides sculpturatus

<400> 146

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Phe Leu Ile Gly Thr  
 -15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys  
 -1 1 5 10

Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys  
 15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala  
 30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro  
 50 55 60



Asn Lys Ser Cys Gly Lys Lys  
65

<210> 147  
<211> 195  
<212> DNA  
<213> Centruroides sculpturatus

<220>  
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<222> (1)..(195)  
<223> Product= Sodium channel modifier toxin

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<301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.  
<302> Genes and peptides from the scorpion Centruroides sculpturatus  
Ewing, that recognize Na<sup>+</sup> channels  
<303> Toxicon  
<304> 39  
<305> 12  
<306> 1893-1898  
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1 5 10 15  
  
ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa tgc aaa gcg aag 96  
Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys  
20 25 30  
  
aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc 144  
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys  
35 40 45  
  
gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt cct aat aaa tca 192  
Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
50 55 60  
  
tgc 195  
Cys  
65

<210> 148  
<211> 65  
<212> PRT  
<213> Centruroides sculpturatus

<400> 148

Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys

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<210> 149
<211> 320
<212> DNA
<213> Centruroides sculpturatus

<220>
<221> CDS
<222> (5)..(262)
<223> Product= Sodium channel modifier toxin precursor
In the mature peptide, the last Cys is amidated, and the last Gly
and the last 2 basic aminoacids are cut

<220>
<221> mat_peptide
<222> (62)..()
<223> Product= Sodium channel modifier toxin

<220>
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<222> (5)..(61)
<223> sig_peptide

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<222> (266)..(320)
<223> 3'UTR

<220>
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<222> (1)..(4)
<223> 5'UTR

<300>
<301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus
Ewing, that recognize Na+ channels
<303> Toxicon
<304> 39

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<305> 12  
 <306> 1893-1898  
 <307> 2001-12-01  
 <309>  
 <313> (5) .. (262)

<400> 149

gaag atg aat tcg ttg ttg atg att act gct tgt ttg gtc ctg atc gga 49  
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly  
 -15 -10 -5

aca gtg tgg gca aag gac ggt tat cta gtg gaa aag acg ggc tgc aaa 97  
 Thr Val Trp Ala Lys Asp Gly Tyr Leu Val Glu Lys Thr Gly Cys Lys  
 -1 1 5 10

aag act tgc tac aaa ttg gga gaa aac gat ttt tgc aat agg gaa tgc 145  
 Lys Thr Cys Tyr Lys Leu Gly Glu Asn Asp Phe Cys Asn Arg Glu Cys  
 15 20 25

aaa tgg aag cac ata gga ggt agt tat ggc tat ttc tac gga ttt ggg 193  
 Lys Trp Lys His Ile Gly Gly Ser Tyr Gly Tyr Phe Tyr Gly Phe Gly  
 30 35 40

tgc tat tgc gaa gga ttg ccc gat agt aca cag act tgg ccc ctt cct 241  
 Cys Tyr Cys Glu Gly Leu Pro Asp Ser Thr Gln Thr Trp Pro Leu Pro  
 45 50 55 60

aat aaa aca tgc ggc aaa aaa taatggcaac gactttttat tgttcaccaa 292  
 Asn Lys Thr Cys Gly Lys Lys  
 65

aagaaatagt gtaacgcttc ttaatttc 320

<210> 150

<211> 86

<212> PRT

<213> Centruroides sculpturatus

<400> 150

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly Thr  
 -15 -10 -5

Val Trp Ala Lys Asp Gly Tyr Leu Val Glu Lys Thr Gly Cys Lys Lys  
 -1 1 5 10

Thr Cys Tyr Lys Leu Gly Glu Asn Asp Phe Cys Asn Arg Glu Cys Lys  
 15 20 25

Trp Lys His Ile Gly Gly Ser Tyr Gly Tyr Phe Tyr Gly Phe Gly Cys  
 30 35 40 45

Tyr Cys Glu Gly Leu Pro Asp Ser Thr Gln Thr Trp Pro Leu Pro Asn  
 50 55 60

Lys Thr Cys Gly Lys Lys  
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<210> 151  
<211> 192  
<212> DNA  
<213> Centruroides sculpturatus

<220>  
<221> CDS  
<222> (1)..(192)  
<223> Product= Sodium channel modifier toxin

<300>  
<301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.  
<302> Genes and peptides from the scorpion Centruroides sculpturatus  
Ewing, that recognize Na<sup>+</sup> channels  
<303> Toxicon  
<304> 39  
<305> 12  
<306> 1893-1898  
<307> 2001-12-01  
<309>  
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<400> 151  
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1 5 10 15

aaa ttg gga gaa aac gat ttt tgc aat agg gaa tgc aaa tgg aag cac 96  
Lys Leu Gly Glu Asn Asp Phe Cys Asn Arg Glu Cys Lys Trp Lys His  
20 25 30

ata gga ggt agt tat ggc tat ttc tac gga ttt ggg tgc tat tgc gaa 144  
Ile Gly Gly Ser Tyr Gly Tyr Phe Tyr Gly Phe Gly Cys Tyr Cys Glu  
35 40 45

gga ttg ccc gat agt aca cag act tgg ccc ctt cct aat aaa aca tgc 192  
Gly Leu Pro Asp Ser Thr Gln Thr Trp Pro Leu Pro Asn Lys Thr Cys  
50 55 60

<210> 152  
<211> 64  
<212> PRT  
<213> Centruroides sculpturatus

<400> 152

Lys Asp Gly Tyr Leu Val Glu Lys Thr Gly Cys Lys Lys Thr Cys Tyr  
1 5 10 15

Lys Leu Gly Glu Asn Asp Phe Cys Asn Arg Glu Cys Lys Trp Lys His

20

25

30

Ile Gly Gly Ser Tyr Gly Tyr Phe Tyr Gly Phe Gly Cys Tyr Cys Glu  
           35                          40                          45

Gly Leu Pro Asp Ser Thr Gln Thr Trp Pro Leu Pro Asn Lys Thr Cys  
       50                          55                          60

<210> 153  
 <211> 319  
 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
 <221> CDS  
 <222> (1)..(261)  
 <223> Product= Sodium channel modifier toxin precursor  
       In the mature peptide, the last 2 basic aminoacids are cut

<220>  
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 <222> (265)..(319)  
 <223> 3'UTR

<220>  
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 <222> (58)..()  
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<220>  
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 <222> (1)..(57)  
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<300>  
 <301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.  
 <302> Genes and peptides from the scorpion Centruroides sculpturatus  
 Ewing, that recognize Na<sup>+</sup> channels  
 <303> Toxicon  
 <304> 39  
 <305> 12  
 <306> 1893-1898  
 <307> 2001-12-01  
 <309>  
 <313> (1)..(261)

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                   -15                  -10                  5

gtg tgg gca aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa 96  
 Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys  
           -1  1                  5                  10

tac ggt tgc ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa tgc 144  
 Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys  
           15                          20                          25

aaa gcg gag aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca 192  
 Lys Ala Glu Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala  
           30                          35                          40                          45

tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt ccc 240  
 Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro  
                                   50                                  55                                  60

aat aaa tca tgc agc aga aaa taatggcaac gactttttat tgtccaccaa 291  
 Asn Lys Ser Cys Ser Arg Lys  
                                   65

cagaaatatt gtaacgcttc ttaattgc 319

<210> 154  
 <211> 87  
 <212> PRT  
 <213> Centruroides sculpturatus  
 <400> 154

Met Asn Ser Leu Leu Ile Ile Thr Ala Cys Leu Phe Leu Ile Gly Thr  
                           -15                          -10                          -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys  
           -1 1                          5                          10

Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys  
           15                          20                          25

Lys Ala Glu Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala  
           30                          35                          40                          45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro  
                                   50                                  55                                  60

Asn Lys Ser Cys Ser Arg Lys  
                           65

<210> 155  
 <211> 198  
 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
 <221> CDS  
 <222> (1)..(198)  
 <223> Product= Sodium channel modifier toxin

<300>  
 <301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.  
 <302> Genes and peptides from the scorpion *Centruroides sculpturatus*  
 Ewing, that recognize Na<sup>+</sup> channels  
 <303> Toxicon  
 <304> 39  
 <305> 12  
 <306> 1893-1898  
 <307> 2001-12-01  
 <309>  
 <313> (1) .. (198)

<400> 155  
 aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac ggt tgc 48  
 Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys  
 1 5 10 15  
  
 ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa tgc aaa gcg gag 96  
 Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Glu  
 20 25 30  
  
 aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc 144  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys  
 35 40 45  
  
 gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt ccc aat aaa tca 192  
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
 50 55 60  
  
 tgc agc 198  
 Cys Ser  
 65

<210> 156  
 <211> 66  
 <212> PRT  
 <213> *Centruroides sculpturatus*

<400> 156  
 Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys  
 1 5 10 15  
  
 Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Glu  
 20 25 30  
  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys  
 35 40 45  
  
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
 50 55 60

Cys Ser  
65

<210> 157  
<211> 323  
<212> DNA  
<213> Centruroides sculpturatus

<220>  
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<222> (5)..(265)  
<223> Product= Sodium channel modifier toxin precursor  
In the mature peptide, the last 2 basic aminoacids are cut

<220>  
<221> 3'UTR  
<222> (269)..(323)  
<223> 3'UTR

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<221> 5'UTR  
<222> (1)..(4)  
<223> 5'UTR

<220>  
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<222> (5)..(61)  
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<220>  
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<223> Product= Sodium channel modifier toxin

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<302> Genes and peptides from the scorpion Centruroides sculpturatus  
Ewing, that recognize Na<sup>+</sup> channels  
<303> Toxicon  
<304> 39  
<305> 12  
<306> 1893-1898  
<307> 2001-12-01  
<309>  
<313> (5)..(265)

<400> 157  
gaag atg aat tcg ttg ttg atg atc act gct tgt ttg ttc ctg atc gga 49  
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Phe Leu Ile Gly  
-15 -10 -5

acc gtg tgg gca aga gaa ggt tat ctg gta aac aag agc acg ggc tgc 97  
Thr Val Trp Ala Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys  
-1 1 5 10

aaa tac ggt tgc ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa 145



Lys Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu  
 15 20 25  
 tgc aaa gcg aag aac caa gga ggt agt tac ggg tat tgc tac gct ttc 193  
 Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe  
 30 35 40  
 gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt 241  
 Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu  
 45 50 55 60  
 cct aat aaa tca tgc agc aga aaa taatggcaac gactttttat tgtccaccaa 295  
 Pro Asn Lys Ser Cys Ser Arg Lys  
 65  
 cagaaatagt gtaacgcttc ttaatttc 323

<210> 158  
 <211> 87  
 <212> PRT  
 <213> Centruroides sculpturatus

<400> 158

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Phe Leu Ile Gly Thr  
 -15 -10 -5

Val Trp Ala Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys  
 -1 1 5 10

Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys  
 15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala  
 30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro  
 50 55 60

Asn Lys Ser Cys Ser Arg Lys  
 65

<210> 159  
 <211> 198  
 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
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 <223> Product= Sodium channel modifier toxin

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 <301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.  
 <302> Genes and peptides from the scorpion *Centruroides sculpturatus*  
 Ewing, that recognize Na<sup>+</sup> channels  
 <303> Toxicon  
 <304> 39  
 <305> 12  
 <306> 1893-1898  
 <307> 2001-12-01  
 <309>  
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<400> 159  
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 Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys  
 1 5 10 15  
  
 ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa tgc aaa gcg aag 96  
 Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys  
 20 25 30  
  
 aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc 144  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys  
 35 40 45  
  
 gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt cct aat aaa tca 192  
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
 50 55 60  
  
 tgc agc 198  
 Cys Ser  
 65

<210> 160  
 <211> 66  
 <212> PRT  
 <213> *Centruroides sculpturatus*

<400> 160  
 Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys  
 1 5 10 15  
  
 Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys  
 20 25 30  
  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys  
 35 40 45  
  
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
 50 55 60  
  
 Cys Ser

65

<210> 161  
 <211> 323  
 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
 <221> CDS  
 <222> (5)..(265)  
 <223> Product= Sodium channel modifier toxin precursor  
 In the mature peptide, the last 2 basic aminoacids are cut

<220>  
 <221> 3'UTR  
 <222> (269)..(323)  
 <223> 3'UTR

<220>  
 <221> mat\_peptide  
 <222> (62)..()  
 <223> Product= Sodium channel modifier toxin

<220>  
 <221> 5'UTR  
 <222> (1)..(4)  
 <223> 5'UTR

<220>  
 <221> sig\_peptide  
 <222> (5)..(61)  
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<300>  
 <301> Genes and peptides from the scorpion Centruroides sculpturatus  
 Ewing, that recognize Na<sup>+</sup> channels  
 <302> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.  
 <303> Toxicon  
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 <306> 1893-1898  
 <307> 2001-12-01  
 <309>  
 <313> (5)..(265)

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 -15 -10 -5

acc gtg tgg gca aaa gaa ggt tat ctg gta aac aag agc acg gcc tgc 97  
 Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Ala Cys  
 -1 1 5 10

aaa tac ggt tgc ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa 145  
 Lys Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu

15	20	25	
tgc aaa gcg aag aac caa gga ggt agt tac ggg tat tgc tac gct ttc			193
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe			
30	35	40	
gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt			241
Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu			
45	50	55	60
cct aat aaa tca tgc agc aga aaa taatggcaac gactttttat tgtccaccaa			295
Pro Asn Lys Ser Cys Ser Arg Lys			
65			
cagaaatatt gtaacgcttc ttaattga			323

<210> 162  
 <211> 87  
 <212> PRT  
 <213> Centruroides sculpturatus

<400> 162

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Phe Leu Ile Gly Thr		
-15	-10	-5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Ala Cys Lys		
-1 1	5	10

Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys		
15	20	25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala		
30	35	40
		45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro		
50	55	60

Asn Lys Ser Cys Ser Arg Lys
65

<210> 163  
 <211> 198  
 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
 <221> CDS  
 <222> (1)..(198)  
 <223> Product= Sodium channel modifier toxin

<300>  
 <301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.  
 <302> Genes and peptides from the scorpion *Centruroides sculpturatus*  
 Ewing, that recognize Na<sup>+</sup> channels  
 <303> Toxicon  
 <304> 39  
 <305> 12  
 <306> 1893-1898  
 <307> 2001-12-01  
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 1 5 10 15  
  
 ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa tgc aaa gcg aag 96  
 Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys  
 20 25 30  
  
 aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc 144  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys  
 35 40 45  
  
 gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt cct aat aaa tca 192  
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
 50 55 60  
  
 tgc agc 198  
 Cys Ser  
 65

<210> 164  
 <211> 66  
 <212> PRT  
 <213> *Centruroides sculpturatus*

<400> 164  
 Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Ala Cys Lys Tyr Gly Cys  
 1 5 10 15  
  
 Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys  
 20 25 30  
  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys  
 35 40 45  
  
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
 50 55 60  
  
 Cys Ser  
 65

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<210> 165
<211> 323
<212> DNA
<213> Centruroides sculpturatus

<220>
<221> CDS
<222> (5)..(265)
<223> Product= Sodium channel modifier toxin precursor
      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

<220>
<221> 3'UTR
<222> (269)..(323)
<223> 3'UTR

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<223> 5'UTR

<220>
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<222> (62)..()
<223> Product= Sodium channel modifier toxin

<220>
<221> sig_peptide
<222> (5)..(61)
<223> sig_peptide

<300>
<301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus
      Ewing, that recognize Na+ channels
<303> Toxicon
<304> 39
<305> 12
<306> 1893-1898
<307> 2001-12-01
<309>
<313> (5)..(265)

<400> 165
gaag atg aat tcg ttg ttg atc atc act gct tgt ttc gcc ctg gtc gga      49
      Met Asn Ser Leu Leu Ile Ile Thr Ala Cys Phe Ala Leu Val Gly
              -15                      -10                      -5

aca gtg tgg gca aag gaa ggt tat ctg gtg aag aag agc gat ggc tgc      97
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys
      -1  1                      5                      10

aaa tac gat tgc ttt tgg ttg gga aaa aac gaa cac tgc gat acg gaa      145
Lys Tyr Asp Cys Phe Trp Leu Gly Lys Asn Glu His Cys Asp Thr Glu

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15	20	25	
tgc aaa gcg aag aac caa gga ggt agt tac ggg tat tgc tac gct ttc			193
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe			
30	35	40	
gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt			241
Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu			
45	50	55	60
cct aat aaa tca tgc ggc aaa aaa taatagcaac aacttttttat tgtccaccaa			295
Pro Asn Lys Ser Cys Gly Lys Lys			
65			
cggaatatgt gtaacgcttc ttaattgc			323

<210> 166  
 <211> 87  
 <212> PRT  
 <213> Centruroides sculpturatus

<400> 166

Met Asn Ser Leu Leu Ile Ile Thr Ala Cys Phe Ala Leu Val Gly Thr	
-15	-10
-5	

Val Trp Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys	
-1 1	5
	10

Tyr Asp Cys Phe Trp Leu Gly Lys Asn Glu His Cys Asp Thr Glu Cys	
15	20
	25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala	
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	40
	45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro	
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Asn Lys Ser Cys Gly Lys Lys	
65	

<210> 167  
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 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
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 <223> Product= Sodium channel modifier toxin

<300>  
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 Ewing, that recognize Na<sup>+</sup> channels  
 <303> Toxicon  
 <304> 39  
 <305> 12  
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 <313> (1)..(195)

<400> 167  
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 Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Asp Cys  
 1 5 10 15  
  
 ttt tgg ttg gga aaa aac gaa cac tgc gat acg gaa tgc aaa gcg aag 96  
 Phe Trp Leu Gly Lys Asn Glu His Cys Asp Thr Glu Cys Lys Ala Lys  
 20 25 30  
  
 aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc 144  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys  
 35 40 45  
  
 gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt cct aat aaa tca 192  
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
 50 55 60  
  
 tgc 195  
 Cys  
 65

<210> 168  
 <211> 65  
 <212> PRT  
 <213> *Centruroides sculpturatus*

<400> 168  
 Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Asp Cys  
 1 5 10 15  
  
 Phe Trp Leu Gly Lys Asn Glu His Cys Asp Thr Glu Cys Lys Ala Lys  
 20 25 30  
  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys  
 35 40 45  
  
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
 50 55 60  
  
 Cys  
 65



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<210> 169
<211> 323
<212> DNA
<213> Centruroides sculpturatus

<220>
<221> CDS
<222> (5)..(265)
<223> Product= Sodium channel modifier toxin precursor
      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

<220>
<221> 3'UTR
<222> (269)..(323)
<223> 3'UTR

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<222> (1)..(4)
<223> 5'UTR

<220>
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<222> (62)..()
<223> Product= Sodium channel modifier toxin

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<222> (5)..(61)
<223> sig_peptide

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<301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
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      Ewing, that recognize Na+ channels
<303> Toxicon
<304> 39
<305> 12
<306> 1893-1898
<307> 2001-12-01
<309>
<313> (5)..(265)

<400> 169
gaag atg aat tgc ttg ttg atg atc act gct tgt ttc gcc ctg gtc gga      49
      Met Asn Ser Leu Leu Met Ile Thr Ala Cys Phe Ala Leu Val Gly
              -15                      -10                      -5

aca gtg tgg gca aag gaa ggt tat ctg gtg aag aag agc gat ggc tgc      97
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys
              -1  1                      5                      10

aaa tac gat tgc ttt tgg ttg gga gaa aac gaa ggc tgc gat aag gaa      145
Lys Tyr Asp Cys Phe Trp Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu

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15	20	25	
tgc aaa gcg aag aac caa gga ggt agt tac ggg tat tgc tac gct ttc			193
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe			
30	35	40	
gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt			241
Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu			
45	50	55	60
cct aat aaa tca tgc ggc aaa aaa taatagcaac aacttttttat tgtccaccaa			295
Pro Asn Lys Ser Cys Gly Lys Lys			
65			
cagaaatagt gtaacgcttc ttaattgc			323

<210> 170  
 <211> 87  
 <212> PRT  
 <213> Centruroides sculpturatus

<400> 170

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Phe Ala Leu Val Gly Thr		
-15	-10	-5

Val Trp Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys		
-1 1	5	10

Tyr Asp Cys Phe Trp Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys		
15	20	25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala		
30	35	40
		45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro		
50	55	60

Asn Lys Ser Cys Gly Lys Lys
65

<210> 171  
 <211> 195  
 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
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 <222> (1)..(195)  
 <223> Product= Sodium channel modifier toxin

<300>  
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 Ewing, that recognize Na<sup>+</sup> channels  
 <303> Toxicon  
 <304> 39  
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 <306> 1893-1898  
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 Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Asp Cys  
 1 5 10 15  
  
 ttt tgg ttg gga gaa aac gaa ggc tgc gat aag gaa tgc aaa gcg aag 96  
 Phe Trp Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys  
 20 25 30  
  
 aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc 144  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys  
 35 40 45  
  
 gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt cct aat aaa tca 192  
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
 50 55 60  
  
 tgc 195  
 Cys  
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<210> 172  
 <211> 65  
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 <213> *Centruroides sculpturatus*

<400> 172  
 Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Asp Cys  
 1 5 10 15  
  
 Phe Trp Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys  
 20 25 30  
  
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys  
 35 40 45  
  
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser  
 50 55 60  
  
 Cys  
 65

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<210> 173
<211> 323
<212> DNA
<213> Centruroides sculpturatus

<220>
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<223> Product= Sodium channel modifier toxin precursor
      In the mature peptide, the last 2 basic aminoacids are cut

<220>
<221> 3'clip
<222> (269)..(323)
<223> 3'clip

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<222> (1)..(4)
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<220>
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<303> Toxicon
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<309>
<313> (5)..(265)

<400> 173
gaag atg aac tcg ttg ttg atc atc act gct tgt ttg ttc ctg atc gga      49
      Met Asn Ser Leu Leu Ile Ile Thr Ala Cys Leu Phe Leu Ile Gly
              -15                      -10                      -5

acc gtg tgg gca aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc      97
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
              -1  1                      5                      10

aaa tac ggt tgc ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa      145
Lys Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu
              15                      20                      25

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tgc aaa gcg aag aac caa gga ggt agt tac ggc tat tgc tac gct ttc 193  
 Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe  
     30                    35                    40

gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt 241  
 Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu  
     45                    50                    55                    60

cct aat aaa tca tgc agc aga aaa taatggcaac gactttttat tgtccaccaa 295  
 Pro Asn Lys Ser Cys Ser Arg Lys  
                     65

cagaaatagt gtaacgcttc ttaattgc 323

<210> 174  
 <211> 87  
 <212> PRT  
 <213> Centruroides sculpturatus

<400> 174

Met Asn Ser Leu Leu Ile Ile Thr Ala Cys Leu Phe Leu Ile Gly Thr  
                     -15                    -10                    -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys  
     -1  1                    5                    10

Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys  
     15                    20                    25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala  
     30                    35                    40                    45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro  
                     50                    55                    60

Asn Lys Ser Cys Ser Arg Lys  
                     65

<210> 175  
 <211> 198  
 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
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 <223> Product= Sodium channel modifier toxin

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<301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.  
 <302> Genes and peptides from the scorpion *Centruroides sculpturatus*  
 Ewing, that recognize Na<sup>+</sup> channels

<303> Toxicon

<304> 39

<305> 12

<306> 1893-1898

<307> 2001-12-01

<309>

<313> (1)..(198)

<400> 175

aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac ggt tgc	48
Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys	
1 5 10 15	

ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa tgc aaa gcg aag	96
Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys	
20 25 30	

aac caa gga ggt agt tac ggc tat tgc tac gct ttc gca tgc tgg tgc	144
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys	
35 40 45	

gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt cct aat aaa tca	192
Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser	
50 55 60	

tgc agc	198
Cys Ser	
65	

<210> 176

<211> 66

<212> PRT

<213> *Centruroides sculpturatus*

<400> 176

Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys
1 5 10 15

Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys
20 25 30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
35 40 45

Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
50 55 60

Cys Ser
65

<210> 177  
 <211> 313  
 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
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 <223> Product= Sodium channel modifier toxin

<220>  
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<220>  
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<220>  
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<220>  
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 Ewing, that recognize Na<sup>+</sup> channels  
 <303> Toxicon  
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 <305> 12  
 <306> 1893-1898  
 <307> 2001-12-01  
 <309>  
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 -15 -10 -5

act gtg ttg gca gag gat ggt tat ttg ttt gac aag aga aag cgc tgc 97  
 Thr Val Leu Ala Glu Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys  
 -1 1 5 10

aca ctc gaa tgc ata gac aag aca gga gac aaa aat tgc gat agg aat 145  
 Thr Leu Glu Cys Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn  
 15 20 25

tgc aag aat gaa gga ggt agt ttt ggc aaa tgc tcc tat ttt gca tgc 193

Cys Lys Asn Glu Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys  
 30 35 40  
 tgg tgc aaa gga ttg ccc gga att aca ccg att tca cgt act cct ggt 241  
 Trp Cys Lys Gly Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly  
 45 50 55 60  
 aaa aca tgt aaa ata taatggcaac ttttttttatt gtgcaccaac agaaatagtg 296  
 Lys Thr Cys Lys Ile  
 65  
 taacgcttct taattgc 313

<210> 178  
 <211> 84  
 <212> PRT  
 <213> Centruroides sculpturatus

<400> 178

Met Asn Ser Leu Leu Met Ile Thr Thr Cys Leu Ile Leu Ile Gly Thr  
 -15 -10 -5

Val Leu Ala Glu Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys Thr  
 -1 1 5 10

Leu Glu Cys Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys  
 15 20 25

Lys Asn Glu Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp  
 30 35 40 45

Cys Lys Gly Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys  
 50 55 60

Thr Cys Lys Ile  
 65

<210> 179  
 <211> 195  
 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
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 <223> Product= Sodium channel modifier toxin

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 <301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.



<302> Genes and peptides from the scorpion *Centruroides sculpturatus*  
Ewing, that recognize Na<sup>+</sup> channels

<303> Toxicon

<304> 39

<305> 12

<306> 1893-1898

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<309>

<313> (1) . . (195)

<400> 179

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Glu Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys Thr Leu Glu Cys  
1 5 10 15

ata gac aag aca gga gac aaa aat tgc gat agg aat tgc aag aat gaa 96  
Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys Lys Asn Glu  
20 25 30

gga ggt agt ttt ggc aaa tgc tcc tat ttt gca tgc tgg tgc aaa gga 144  
Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp Cys Lys Gly  
35 40 45

ttg ccc gga att aca cgc att tca cgt act cct ggt aaa aca tgt aaa 192  
 Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys Thr Cys Lys  
 50 55 60

ata	195
Ile	
65	

$\langle 210 \rangle$  180

<211> 65

<212> PRT

<213> Centruroides sculpturatus

<400> 180

Glu Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys Thr Leu Glu Cys  
1 5 10 15

Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys Lys Asn Glu  
20 25 30

Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp Cys Lys Gly  
35 40 45

Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys Thr Cys Lys  
50 55 60

Ile  
65

<210> 181  
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 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
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 <223> Product= Sodium channel modifier toxin precursor

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 <223> Product= Sodium channel modifier toxin

<220>  
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 Ewing, that recognize Na<sup>+</sup> channels  
 <303> Toxicon  
 <304> 39  
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 -15 -10 -5

act gtg ttg gca gag gat ggt tat ttg ttt gac aag aga aag cgc tgc 97  
 Thr Val Leu Ala Glu Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys  
 -1 1 5 10

aca ctc gaa tgc ata gac atg aca gga gac aaa aat tgc gat agg aat 145  
 Thr Leu Glu Cys Ile Asp Met Thr Gly Asp Lys Asn Cys Asp Arg Asn  
 15 20 25

tgc aag aag gaa gga ggt agt ttt ggc aaa tgc tcc tat ttt gca tgc 193  
 Cys Lys Lys Glu Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys

30	35	40	
tgg tgc aaa gga ttg	ccc gga att aca ccg	att tca cgt act cct ggt	241
Trp Cys Lys Gly Leu	Pro Gly Ile Thr Pro	Ile Ser Arg Thr Pro Gly	
45	50	55 60	
aaa aca tgt aaa ata taatggcaac tttttttatt gtgcaccaac agaaatattg			296
Lys Thr Cys Lys Ile			
	65		
taacgcttct taatttc			313

<210> 182  
 <211> 84  
 <212> PRT  
 <213> Centruroides sculpturatus

<400> 182

Met Asn Ser Leu Leu Ile Ile Thr Thr Cys Leu Ile Leu Ile Gly Thr	
	-15 -10 -5

Val Leu Ala Glu Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys Thr	
	-1 1 5 10

Leu Glu Cys Ile Asp Met Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys	
	15 20 25

Lys Lys Glu Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp	
	30 35 40 45

Cys Lys Gly Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys	
	50 55 60

Thr Cys Lys Ile	
	65

<210> 183  
 <211> 195  
 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
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<300>  
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 Ewing, that recognize Na<sup>+</sup> channels

<303> Toxicon  
 <304> 39  
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 <306> 1893-1898  
 <307> 2001-12-01  
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 1 5 10 15  
 ata gac atg aca gga gac aaa aat tgc gat agg aat tgc aag aag gaa 96  
 Ile Asp Met Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys Lys Lys Glu  
 20 25 30  
 gga ggt agt ttt ggc aaa tgc tcc tat ttt gca tgc tgg tgc aaa gga 144  
 Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp Cys Lys Gly  
 35 40 45  
 ttg ccc gga att aca ccg att tca cgt act cct ggt aaa aca tgt aaa 192  
 Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys Thr Cys Lys  
 50 55 60  
 ata 195  
 Ile  
 65

<210> 184  
 <211> 65  
 <212> PRT  
 <213> Centruroides sculpturatus

<400> 184  
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 1 5 10 15  
 Ile Asp Met Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys Lys Lys Glu  
 20 25 30  
 Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp Cys Lys Gly  
 35 40 45  
 Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys Thr Cys Lys  
 50 55 60  
 Ile  
 65

<210> 185  
 <211> 314

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<212> DNA
<213> Centruroides sculpturatus

<220>
<221> CDS
<222> (2)..(256)
<223> Product= Sodium channel modifier toxin precursor
      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

<220>
<221> 5'UTR
<222> (260)..(314)
<223> 5'UTR

<220>
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<222> (1)..(1)
<223> 5'UTR

<220>
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<223> Product= Sodium channel modifier toxin

<220>
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<223> sig_peptide

<300>
<301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus
      Ewing, that recognize Na+ channels
<303> Toxicon
<304> 39
<305> 12
<306> 1893-1898
<307> 2001-12-01
<309>
<313> (5)..(256)

<400> 185
g atg aac tcg ttg ttg atg atc act gct tgt ttg gtc cta ttc gga aca      49
  Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly Thr
           -15                      -10                      -5

gtc tgg tca gag aaa ggt tat ctg gtg cat gag gac acg ggc tgc aga      97
Val Trp Ser Glu Lys Gly Tyr Leu Val His Glu Asp Thr Gly Cys Arg
   -1  1                      5                      10

tac aag tgc act ttt tcg gga gaa aat agt tac tgc gat aag gaa tgc      145
Tyr Lys Cys Thr Phe Ser Gly Glu Asn Ser Tyr Cys Asp Lys Glu Cys
   15                      20                      25

aag agc caa gga ggt gat tct ggc att tgc caa tct aag gcg tgt tat      193
Lys Ser Gln Gly Gly Asp Ser Gly Ile Cys Gln Ser Lys Ala Cys Tyr

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30              35              40              45
tgc caa ggt ttg ccc gaa gat aca aag act tgg ccc ctt att ggt aaa      241
Cys Gln Gly Leu Pro Glu Asp Thr Lys Thr Trp Pro Leu Ile Gly Lys
              50              55              60

tta tgc ggc aga aaa taatggcttc gtctttttat tgttcaccaa caaaaatagt      296
Leu Cys Gly Arg Lys
              65

gtaacgcttc ttaatttc      314

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<210> 186
<211> 85
<212> PRT
<213> Centruroides sculpturatus

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<400> 186

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Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly Thr
              -15              -10              -5

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Val Trp Ser Glu Lys Gly Tyr Leu Val His Glu Asp Thr Gly Cys Arg
              -1 1              5              10

```

```

Tyr Lys Cys Thr Phe Ser Gly Glu Asn Ser Tyr Cys Asp Lys Glu Cys
              15              20              25

```

```

Lys Ser Gln Gly Gly Asp Ser Gly Ile Cys Gln Ser Lys Ala Cys Tyr
30              35              40              45

```

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Cys Gln Gly Leu Pro Glu Asp Thr Lys Thr Trp Pro Leu Ile Gly Lys
              50              55              60

```

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Leu Cys Gly Arg Lys
              65

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<210> 187
<211> 189
<212> DNA
<213> Centruroides sculpturatus

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<220>
<221> CDS
<222> (1)..(189)
<223> Product= Sodium channel modifier toxin

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<300>
<301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus
Ewing, that recognize Na+ channels

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<303> Toxicon  
 <304> 39  
 <305> 12  
 <306> 1893-1898  
 <307> 2001-12-01  
 <309>  
 <313> (1) .. (189)

<400> 187  
 gag aaa ggt tat ctg gtg cat gag gac acg ggc tgc aga tac aag tgc 48  
 Glu Lys Gly Tyr Leu Val His Glu Asp Thr Gly Cys Arg Tyr Lys Cys  
 1 5 10 15  
 act ttt tcg gga gaa aat agt tac tgc gat aag gaa tgc aag agc caa 96  
 Thr Phe Ser Gly Glu Asn Ser Tyr Cys Asp Lys Glu Cys Lys Ser Gln  
 20 25 30  
 gga ggt gat tct ggc att tgc caa tct aag gcg tgt tat tgc caa ggt 144  
 Gly Gly Asp Ser Gly Ile Cys Gln Ser Lys Ala Cys Tyr Cys Gln Gly  
 35 40 45  
 ttg ccc gaa gat aca aag act tgg ccc ctt att ggt aaa tta tgc 189  
 Leu Pro Glu Asp Thr Lys Thr Trp Pro Leu Ile Gly Lys Leu Cys  
 50 55 60

<210> 188  
 <211> 63  
 <212> PRT  
 <213> Centruroides sculpturatus

<400> 188  
 Glu Lys Gly Tyr Leu Val His Glu Asp Thr Gly Cys Arg Tyr Lys Cys  
 1 5 10 15  
 Thr Phe Ser Gly Glu Asn Ser Tyr Cys Asp Lys Glu Cys Lys Ser Gln  
 20 25 30  
 Gly Gly Asp Ser Gly Ile Cys Gln Ser Lys Ala Cys Tyr Cys Gln Gly  
 35 40 45  
 Leu Pro Glu Asp Thr Lys Thr Trp Pro Leu Ile Gly Lys Leu Cys  
 50 55 60

<210> 189  
 <211> 321  
 <212> DNA  
 <213> Centruroides sculpturatus  
 <220>  
 <221> CDS  
 <222> (5) .. (265)  
 <223> Product= Sodium channel modifier toxin precursor  
 In the mature peptide, the last Asn is amidated, and the last Gly

and the last basic aminoacid are cut

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<220>
<221> 3'UTR
<222> (269)..(321)
<223> 3'UTR

<220>
<221> 5'UTR
<222> (1)..(4)
<223> 5'UTR

<220>
<221> mat_peptide
<222> (62)..()
<223> Product= Sodium channel modifier toxin

<220>
<221> sig_peptide
<222> (5)..(61)
<223> sig_peptide

<300>
<301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus
Ewing, that recognize Na+ channels
<303> Toxicon
<304> 39
<305> 12
<306> 1893-1898
<307> 2001-12-01
<309>
<313> (5)..(265)

<400> 189
gaag atg aac tcg ttg ttg atc atc gct gct tgt ttg gcc ctg atc gga      49
    Met Asn Ser Leu Leu Ile Ile Ala Ala Cys Leu Ala Leu Ile Gly
              -15                      -10                      -5

aca gtc tgg gca aag gaa ggt tat att gtg aac tat cac acg ggc tgc      97
Thr Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr His Thr Gly Cys
      -1  1                      5                      10

aaa tac gaa tgc ttt aaa ttg gga gac aac gat tat tgc ctg agg gaa      145
Lys Tyr Glu Cys Phe Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu
      15                      20                      25

tgc aaa ttg aga cac gga aaa ggt agt ggc ggc tat tgc tac gct ttt      193
Cys Lys Leu Arg His Gly Lys Gly Ser Gly Gly Tyr Cys Tyr Ala Phe
      30                      35                      40

ggg tgc tgg tgc aca cac ttg tac gaa caa gca gtg gtt tgg ccc ctt      241
Gly Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu
      45                      50                      55                      60

cct aag aaa aaa tgc aac gga aaa taatggcaac gacttttttat tgtccaccaa      295
Pro Lys Lys Lys Cys Asn Gly Lys

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65

cagaaatagt gtaacgcttc ttaatt

321

&lt;210&gt; 190

&lt;211&gt; 87

&lt;212&gt; PRT

&lt;213&gt; Centruroides sculpturatus

&lt;400&gt; 190

Met Asn Ser Leu Leu Ile Ile Ala Ala Cys Leu Ala Leu Ile Gly Thr  
                   -15                  -10                  -5

Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr His Thr Gly Cys Lys  
           -1  1                  5                  10

Tyr Glu Cys Phe Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys  
      15                  20                  25

Lys Leu Arg His Gly Lys Gly Ser Gly Gly Tyr Cys Tyr Ala Phe Gly  
   30                  35                  40                  45

Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro  
                   50                  55                  60

Lys Lys Lys Cys Asn Gly Lys  
                   65

&lt;210&gt; 191

&lt;211&gt; 198

&lt;212&gt; DNA

&lt;213&gt; Centruroides sculpturatus

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(198)

&lt;223&gt; Product= Sodium channel modifier toxin

&lt;300&gt;

&lt;301&gt; Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. &amp; Possani L.D.

<302> Genes and peptides from the scorpion Centruroides sculpturatus  
 Ewing, that recognize Na<sup>+</sup> channels

&lt;303&gt; Toxicon

&lt;304&gt; 39

&lt;305&gt; 12

&lt;306&gt; 1893-1898

&lt;307&gt; 2001-12-01

&lt;309&gt;

&lt;313&gt; (1)..(198)

<400> 191  
aag gaa ggt tat att gtg aac tat cac acg ggc tgc aaa tac gaa tgc 48  
Lys Glu Gly Tyr Ile Val Asn Tyr His Thr Gly Cys Lys Tyr Glu Cys  
1 5 10 15  
  
ttt aaa ttg gga gac aac gat tat tgc ctg agg gaa tgc aaa ttg aga 96  
Phe Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg  
20 25 30  
  
cac gga aaa ggt agt ggc ggc tat tgc tac gct ttt ggg tgc tgg tgc 144  
His Gly Lys Gly Ser Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys  
35 40 45  
  
aca cac ttg tac gaa caa gca gtg gtt tgg ccc ctt cct aag aaa aaa 192  
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Lys  
50 55 60  
  
tgc aac 198  
Cys Asn  
65

<210> 192  
<211> 66  
<212> PRT  
<213> Centruroides sculpturatus

<400> 192  
Lys Glu Gly Tyr Ile Val Asn Tyr His Thr Gly Cys Lys Tyr Glu Cys  
1 5 10 15  
  
Phe Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg  
20 25 30  
  
His Gly Lys Gly Ser Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys  
35 40 45  
  
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Lys  
50 55 60  
  
Cys Asn  
65

<210> 193  
<211> 320  
<212> DNA  
<213> Centruroides sculpturatus  
  
<220>  
<221> CDS  
<222> (5)..(262)  
<223> Product= Sodium channel modifier toxin precursor  
In the mature peptide, the last Cys is amidated, and the last Gly

and the last 2 basic aminoacids are cut

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<220>
<221> 5'clip
<222> (266)..(320)
<223> 5'clip

<220>
<221> 5'UTR
<222> (1)..(4)
<223> 5'UTR

<220>
<221> mat_peptide
<222> (62)..()
<223> Product= Sodium channel modifier toxin

<220>
<221> sig_peptide
<222> (5)..(61)
<223> sig_peptide

<300>
<301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus
Ewing, that recognize Na+ channels
<303> Toxicon
<304> 39
<305> 12
<306> 1893-1898
<307> 2001-12-01
<309>
<313> (5)..(262)

<400> 193
gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc gtg atc gga      49
    Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Val Ile Gly
          -15                      -10                      -5

aca gtg tgg gca aag gaa ggt tat ctg gtg gac gta aag ggc tgc aaa      97
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asp Val Lys Gly Cys Lys
      -1  1                      5                      10

aaa aat tgc tgg aaa ttg gga gat aac gat tat tgc aat agg gaa tgt      145
Lys Asn Cys Trp Lys Leu Gly Asp Asn Asp Tyr Cys Asn Arg Glu Cys
      15                      20                      25

aaa tgg aag cac ata gga ggt agt tac ggc tat tgc tac gga ttt ggg      193
Lys Trp Lys His Ile Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe Gly
      30                      35                      40

tgc tat tgc gaa gga ttg ccc gat agt aca cag act tgg ccc ctt cct      241
Cys Tyr Cys Glu Gly Leu Pro Asp Ser Thr Gln Thr Trp Pro Leu Pro
      45                      50                      55                      60

aat aaa aca tgc ggc aaa aaa taatggcaac gactttttat tgtctaccaa      292
Asn Lys Thr Cys Gly Lys Lys

```

65

cagaaatagt gtaacgcttc ttaattgc

320

<210> 194  
 <211> 86  
 <212> PRT  
 <213> Centruroides sculpturatus

&lt;400&gt; 194

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Val Ile Gly Thr  
                   -15                  -10                  -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asp Val Lys Gly Cys Lys Lys  
           -1  1                  5                  10

Asn Cys Trp Lys Leu Gly Asp Asn Asp Tyr Cys Asn Arg Glu Cys Lys  
      15                  20                  25

Trp Lys His Ile Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys  
 30                  35                  40                  45

Tyr Cys Glu Gly Leu Pro Asp Ser Thr Gln Thr Trp Pro Leu Pro Asn  
                   50                  55                  60

Lys Thr Cys Gly Lys Lys  
           65

<210> 195  
 <211> 192  
 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
 <221> CDS  
 <222> (1)..(192)  
 <223> Product= Sodium channel modifier toxin

<300>  
 <301> Corona, M., Valdez Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.  
 <302> Genes and peptides from the scorpion Centruroides sculpturatus  
 Ewing, that recognize Na<sup>+</sup> channels  
 <303> Toxicon  
 <304> 39  
 <305> 12  
 <306> 1893-1898  
 <307> 2001-12-01  
 <309>  
 <313> (1)..(192)

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<400> 195
aag gaa ggt tat ctg gtg gac gta aag ggc tgc aaa aaa aat tgc tgg      48
Lys Glu Gly Tyr Leu Val Asp Val Lys Gly Cys Lys Lys Asn Cys Trp
1          5          10          15

aaa ttg gga gat aac gat tat tgc aat agg gaa tgt aaa tgg aag cac      96
Lys Leu Gly Asp Asn Asp Tyr Cys Asn Arg Glu Cys Lys Trp Lys His
          20          25          30

ata gga ggt agt tac ggc tat tgc tac gga ttt ggg tgc tat tgc gaa      144
Ile Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu
          35          40          45

gga ttg ccc gat agt aca cag act tgg ccc ctt cct aat aaa aca tgc      192
Gly Leu Pro Asp Ser Thr Gln Thr Trp Pro Leu Pro Asn Lys Thr Cys
          50          55          60

<210> 196
<211> 64
<212> PRT
<213> Centruroides sculpturatus

<400> 196
Lys Glu Gly Tyr Leu Val Asp Val Lys Gly Cys Lys Lys Asn Cys Trp
1          5          10          15

Lys Leu Gly Asp Asn Asp Tyr Cys Asn Arg Glu Cys Lys Trp Lys His
          20          25          30

Ile Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu
          35          40          45

Gly Leu Pro Asp Ser Thr Gln Thr Trp Pro Leu Pro Asn Lys Thr Cys
          50          55          60

<210> 197
<211> 190
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS
<222> (1)..(129)
<223> Product= Erg channel modifier toxin precursor

<220>
<221> 3'UTR
<222> (130)..(190)
<223> 3'UTR

<400> 197
gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac      48

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Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15  
 tac caa gag tgt cag gat tgt tgt aag aaa gct gga cac agt gga gga 96  
 Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Ser Gly Gly  
 20 25 30  
 acc tgt atg ttt ttc aag tgt aaa tgt gcg taa actcgaaaat cagttaataa 149  
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
 35 40  
 tatcaaagtt gtaagctatt tatgaagtga aaaataaaga t 190

<210> 198  
 <211> 42  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 198

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15  
 Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Ser Gly Gly  
 20 25 30  
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
 35 40

<210> 199  
 <211> 126  
 <212> DNA  
 <213> Centruroides exilicauda  
 <220>  
 <221> CDS  
 <222> (1)..(126)  
 <223> Product= Erg channel modifier toxin

<400> 199  
 gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15  
 tac caa gag tgt cag gat tgt tgt aag aaa gct gga cac agt gga gga 96  
 Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Ser Gly Gly  
 20 25 30  
 acc tgt atg ttt ttc aag tgt aaa tgt gcg 126  
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
 35 40

<210> 200

<211> 42  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 200

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15

Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Ser Gly Gly  
 20 25 30

Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
 35 40

<210> 201  
 <211> 197  
 <212> DNA  
 <213> Centruroides exilicauda

<220>  
 <221> CDS  
 <222> (1)..(132)  
 <223> Product= Erg channel modifier toxin precursor

<220>  
 <221> 3'UTR  
 <222> (133)..(197)  
 <223> 3'UTR

<400> 201  
 gat aga gat agc tgt gtt gat aaa tca aaa tgc gga aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr  
 1 5 10 15

tac ggt caa tgt gat gaa tgt tgc aag aaa gct gga gac cgt gca gga 96  
 Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30

atc tgc gag tat tac aag tgt aaa tgt aac cca taa actcgaatgt 142  
 Ile Cys Glu Tyr Tyr Lys Cys Lys Cys Asn Pro  
 35 40

gaattaagaa tatcaaagct ggaagctgtt taaaaagtga aaaataaaga ttatt 197

<210> 202  
 <211> 43  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 202

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr  
 1 5 10 15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
                   20                  25                  30

Ile Cys Glu Tyr Tyr Lys Cys Lys Cys Asn Pro  
           35                  40

<210> 203  
 <211> 129  
 <212> DNA  
 <213> Centruroides exilicauda

<220>  
 <221> CDS  
 <222> (1)..(129)  
 <223> Product= Erg channel modifier toxin

<400> 203  
 gat aga gat agc tgt gtt gat aaa tca aaa tgc gga aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr  
 1                  5                  10                  15

tac ggt caa tgt gat gaa tgt tgc aag aaa gct gga gac cgt gca gga 96  
 Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
                   20                  25                  30

atc tgc gag tat tac aag tgt aaa tgt aac cca 129  
 Ile Cys Glu Tyr Tyr Lys Cys Lys Cys Asn Pro  
           35                  40

<210> 204  
 <211> 43  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 204  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr  
 1                  5                  10                  15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
                   20                  25                  30

Ile Cys Glu Tyr Tyr Lys Cys Lys Cys Asn Pro  
           35                  40

<210> 205  
 <211> 196  
 <212> DNA  
 <213> Centruroides exilicauda



<220>  
 <221> CDS  
 <222> (1)..(132)  
 <223> Product= Erg channel modifier toxin precursor

<220>  
 <221> 3'UTR  
 <222> (133)..(196)  
 <223> 3'UTR

<400> 205  
 gat aga gat agc tgt gtt gat aaa tca aaa tgc gca aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15  
 tac tat caa tgt gat gaa tgt tgc aag aaa gct gga gac cgt gca gga 96  
 Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30  
 acc tgc gag tat ttc aag tgt aaa tgt aac cca taa actcgaatgt 142  
 Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro  
 35 40  
 gaattaagaa tatcaaagct ggaagctgtt taagaagtga aaaataaaga ttat 196

<210> 206  
 <211> 43  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 206  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15  
 Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30  
 Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro  
 35 40

<210> 207  
 <211> 129  
 <212> DNA  
 <213> Centruroides exilicauda

<220>  
 <221> CDS  
 <222> (1)..(129)  
 <223> Product= Erg channel modifier toxin

<400> 207  
 gat aga gat agc tgt gtt gat aaa tca aaa tgc gca aaa tat gga tac 48

```

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ala Lys Tyr Gly Tyr
1          5          10          15

tac tat caa tgt gat gaa tgt tgc aag aaa gct gga gac cgt gca gga      96
Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
          20          25          30

acc tgc gag tat ttc aag tgt aaa tgt aac cca      129
Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro
          35          40

<210> 208
<211> 43
<212> PRT
<213> Centruroides exilicauda

<400> 208

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ala Lys Tyr Gly Tyr
1          5          10          15

Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
          20          25          30

Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro
          35          40

<210> 209
<211> 196
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS
<222> (1)..(132)
<223> Product= Erg channel modifier toxin precursor

<220>
<221> 3'UTR
<222> (133)..(196)
<223> 3'UTR

<400> 209
gat aga gat agc tgt gtt gat aaa tca caa tgc gca aaa tat gga tac      48
Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Ala Lys Tyr Gly Tyr
1          5          10          15

tac tat caa tgt gat gaa tgt tgc aag aaa gct gga gac cgt gca gga      96
Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
          20          25          30

acc tgc gag tat ttc aag tgt aaa tgt aac cca taa actcgaatgt      142
Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro
          35          40

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gaattaagaa tatcaaagct ggaagctggt taagaagtga aaaataaaga ttag 196

<210> 210  
 <211> 43  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 210

Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15

Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30

Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro  
 35 40

<210> 211  
 <211> 129  
 <212> DNA  
 <213> Centruroides exilicauda

<220>  
 <221> CDS  
 <222> (1)..(129)  
 <223> Product= Erg channel modifier toxin

<400> 211  
 gat aga gat agc tgt gtt gat aaa tca caa tgc gca aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15

tac tat caa tgt gat gaa tgt tgc aag aaa gct gga gac cgt gca gga 96  
 Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30

acc tgc gag tat ttc aag tgt aaa tgt aac cca 129  
 Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro  
 35 40

<210> 212  
 <211> 43  
 <212> PRT  
 <213> Centruroides exilicauda

<400> 212

Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15

Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
20 25 30

Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro  
35 40

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<210> 213
<211> 202
<212> DNA
<213> Centruroides limpidus limpidus
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<220>
<221> CDS
<222> (1)..(129)
<223> Product= Erg channel modifier toxin precursor
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<220>
<221> 3'UTR
<222> (130) .. (202)
<223> 3'UTR
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<400> 213  
gat aga gat agc tgt gtt gat aaa tca cga tgc tca aaa tat gga tac 48  
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ser Lys Tyr Gly Tyr  
1 5 10 15

tac	caa	gag	tgt	cag	gat	tgt	tgc	aag	aaa	gct	gga	cac	aat	gga	gga	96
Tyr	Gln	Glu	Cys	Gln	Asp	Cys	Cys	Lys	Lys	Ala	Gly	His	Asn	Gly	Gly	
			20					25					30			

acc tgc atg ttt ttc aag tgt aaa tgt gcg taa actcgaagat gaattaacaa 149  
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
35 40

tatcaaagct gtaatctatt tatgaagtaa aaaataaagt ttttgaaatt tcc 202

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<210> 214
<211> 42
<212> PRT
<213> Centruroides limpidus limpidus
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<400> 214

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ser Lys Tyr Gly Tyr  
1 5 10 15

Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly  
20 25 30

Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
35 40

<210> 215  
 <211> 126  
 <212> DNA  
 <213> Centruroides limpidus limpidus  
  
 <220>  
 <221> CDS  
 <222> (1)..(126)  
 <223> Product= Erg channel modifier toxin

<400> 215  
 gat aga gat agc tgt gtt gat aaa tca cga tgc tca aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ser Lys Tyr Gly Tyr  
 1 5 10 15  
  
 tac caa gag tgt cag gat tgt tgc aag aaa gct gga cac aat gga gga 96  
 Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly  
 20 25 30  
  
 acc tgc atg ttt ttc aag tgt aaa tgt gcg 126  
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
 35 40

<210> 216  
 <211> 42  
 <212> PRT  
 <213> Centruroides limpidus limpidus

<400> 216  
  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ser Lys Tyr Gly Tyr  
 1 5 10 15  
  
 Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly  
 20 25 30  
  
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
 35 40

<210> 217  
 <211> 207  
 <212> DNA  
 <213> Centruroides limpidus limpidus  
  
 <220>  
 <221> CDS  
 <222> (1)..(132)  
 <223> Product= Erg channel modifier toxin precursor

<220>  
 <221> 3'UTR  
 <222> (133)..(207)  
 <223> 3'UTR

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<400> 217
gat aga gat agc tgt gtt gat aaa tca aaa tgt tca aaa tat gga tac      48
Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr
1          5          10          15

tac ggt caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga      96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
          20          25          30

aac tgc gtg tat ttc aag tgt aaa tgt aac cca taa actcgaatgt      142
Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Pro
          35          40

gaattaagaa tatcaaagct ggaagctatt taagaagtga aaaataaaga ttattaaatt      202

tccgc      207

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<210> 218
<211> 43
<212> PRT
<213> Centruroides limpidus limpidus

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<400> 218

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr
1          5          10          15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
          20          25          30

Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Pro
          35          40

```

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<210> 219
<211> 129
<212> DNA
<213> Centruroides limpidus limpidus

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<220>
<221> CDS
<222> (1)..(129)
<223> Product= Erg channel modifier toxin

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<400> 219
gat aga gat agc tgt gtt gat aaa tca aaa tgt tca aaa tat gga tac      48
Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr
1          5          10          15

tac ggt caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga      96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
          20          25          30

aac tgc gtg tat ttc aag tgt aaa tgt aac cca      129

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Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Pro  
 35 40

<210> 220  
 <211> 43  
 <212> PRT  
 <213> Centruroides limpidus limpidus

<400> 220

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr  
 1 5 10 15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30

Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Pro  
 35 40

<210> 221  
 <211> 209  
 <212> DNA  
 <213> Centruroides limpidus limpidus

<220>  
 <221> CDS  
 <222> (1)..(132)  
 <223> Product= Erg channel modifier toxin precursor

<220>  
 <221> 3'UTR  
 <222> (133)..(209)  
 <223> Product= Erg channel modifier toxin

<400> 221  
 gat agg gat agc tgc gtt gac aaa tca aaa tgt tca aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr  
 1 5 10 15  
 tat ggt caa tgt gat aag tgt tgc aag aaa gct gga gac cgt gca gga 96  
 Tyr Gly Gln Cys Asp Lys Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30  
 aac tgc gtg tat ttc aag tgt aaa tgt aac caa taa actcgaatgt 142  
 Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Gln  
 35 40  
 gaacttaaga atatcaaagc tggaagctta tttaagaagt gaaaaataaa gattattaaa 202  
 taagaga 209

<210> 222

<211> 43  
 <212> PRT  
 <213> Centruroides limpidus limpidus

<400> 222

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr  
 1 5 10 15

Tyr Gly Gln Cys Asp Lys Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30

Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Gln  
 35 40

<210> 223  
 <211> 129  
 <212> DNA  
 <213> Centruroides limpidus limpidus

<220>  
 <221> CDS  
 <222> (1)..(129)  
 <223> Product= Erg channel modifier toxin

<400> 223  
 gat agg gat agc tgc gtt gac aaa tca aaa tgt tca aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr  
 1 5 10 15  
 tat ggt caa tgt gat aag tgt tgc aag aaa gct gga gac cgt gca gga 96  
 Tyr Gly Gln Cys Asp Lys Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30  
 aac tgc gtg tat ttc aag tgt aaa tgt aac caa 129  
 Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Gln  
 35 40

<210> 224  
 <211> 43  
 <212> PRT  
 <213> Centruroides limpidus limpidus

<400> 224

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr  
 1 5 10 15

Tyr Gly Gln Cys Asp Lys Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30

Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Gln



35

40

<210> 225  
 <211> 141  
 <212> DNA  
 <213> Centruroides limpidus limpidus  
  
 <220>  
 <221> CDS  
 <222> (1)..(132)  
 <223> Product= Erg channel modifier toxin precursor

<220>  
 <221> 3'UTR  
 <222> (1)..(132)  
 <223> 3'UTR

<400> 225  
 gat agg gat agc tgc gtt gac aaa tca aaa tgc gca aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15  
  
 tat ggt caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga 96  
 Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30  
  
 aac tgc gtg tat tta aag tgt aaa tgt aac caa taa actcgaatg 141  
 Asn Cys Val Tyr Leu Lys Cys Lys Cys Asn Gln  
 35 40

<210> 226  
 <211> 43  
 <212> PRT  
 <213> Centruroides limpidus limpidus

<400> 226  
  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15  
  
 Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30  
  
 Asn Cys Val Tyr Leu Lys Cys Lys Cys Asn Gln  
 35 40

<210> 227  
 <211> 129  
 <212> DNA  
 <213> Centruroides limpidus limpidus  
  
 <220>  
 <221> CDS

<222> (1)..(129)

<223> Product= Erg channel modifier toxin

<400> 227

gat	agg	gat	agc	tgc	gtt	gac	aaa	tca	aaa	tgc	gca	aaa	tat	gga	tac	48
Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Lys	Cys	Ala	Lys	Tyr	Gly	Tyr	
1				5					10					15		

tat	ggt	caa	tgt	gat	gag	tgt	tgc	aag	aaa	gct	gga	gac	cgt	gca	gga	96
Tyr	Gly	Gln	Cys	Asp	Glu	Cys	Cys	Lys	Lys	Ala	Gly	Asp	Arg	Ala	Gly	
		20						25					30			

aac	tgc	gtg	tat	tta	aag	tgt	aaa	tgt	aac	caa						129
Asn	Cys	Val	Tyr	Leu	Lys	Cys	Lys	Cys	Asn	Gln						
		35						40								

<210> 228

<211> 43

<212> PRT

<213> Centruroides limpidus limpidus

<400> 228

Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Lys	Cys	Ala	Lys	Tyr	Gly	Tyr
1				5					10					15	

Tyr	Gly	Gln	Cys	Asp	Glu	Cys	Cys	Lys	Lys	Ala	Gly	Asp	Arg	Ala	Gly
		20						25					30		

Asn	Cys	Val	Tyr	Leu	Lys	Cys	Lys	Cys	Asn	Gln
		35						40		

<210> 229

<211> 244

<212> DNA

<213> Centruroides noxius

<220>

<221> CDS

<222> (1)..(132)

<223> Product= Erg channel modifier toxin precursor

<220>

<221> 3'UTR

<222> (133)..(244)

<223> 3'UTR

<400> 229

gat	aga	gat	agc	tgt	gtt	gat	aaa	tca	aaa	tgc	gga	aaa	tat	gga	tac	48
Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Lys	Cys	Gly	Lys	Tyr	Gly	Tyr	
1				5					10					15		

tac	ggt	caa	tgt	gat	gag	tgt	tgc	aag	aaa	gct	gga	gac	cgt	gca	gga	96
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
                   20                                  25                                  30  
 acc tgc gtg tat tac aag tgt aaa tgt aac cca taa actcgaatgt 142  
 Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
                   35                                  40  
 gaattaagaa tatcaaagct ggaagctgtt taagaagtga aaaataagat tattaaattt 202  
 ccgcacaaac caaccaaaaa aaagtatcga tcgtatcgta tc 244

<210> 230  
 <211> 43  
 <212> PRT  
 <213> Centruroides noxius

<400> 230

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr  
 1                                  5                                  10                                  15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
                   20                                  25                                  30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
                   35                                  40

<210> 231  
 <211> 129  
 <212> DNA  
 <213> Centruroides noxius

<220>  
 <221> CDS  
 <222> (1)..(129)  
 <223> Product= Erg channel modifier toxin

<400> 231  
 gat aga gat agc tgt gtt gat aaa tca aaa tgc gga aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr  
 1                                  5                                  10                                  15

tac ggt caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga 96  
 Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
                   20                                  25                                  30

acc tgc gtg tat tac aag tgt aaa tgt aac cca 129  
 Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
                   35                                  40

<210> 232  
 <211> 43  
 <212> PRT

<213> Centruroides noxius

<400> 232

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr  
1 5 10 15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
20 25 30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
35 40

<210> 233

<211> 212

<212> DNA

<213> Centruroides noxius

<220>

<221> CDS

<222> (1)..(132)

<223> Product= Erg channel modifier toxin precursor

<220>

<221> 3'UTR

<222> (133)..(212)

<223> 3'UTR

<400> 233

gat aga gat agc tgt gtt gat aaa tca caa tgc gga aaa tat gga tac 48  
Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Gly Lys Tyr Gly Tyr  
1 5 10 15

tac ggt caa tgt gat gag tgt tgc aag aaa gct gga gaa cgt gta gga 96  
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Glu Arg Val Gly  
20 25 30

acc tgc gtg tat tac aag tgt aaa tgt aac cca taa actcgaatgt 142  
Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
35 40

gaattaagaa tatcaaagct ggaagctgtt taagaagtga aaaataaaga ttattaaatt 202

tccgcaaatt 212

<210> 234

<211> 43

<212> PRT

<213> Centruroides noxius

<400> 234

Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Gly Lys Tyr Gly Tyr  
1 5 10 15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Glu Arg Val Gly  
                   20                  25                  30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
           35                  40

<210> 235  
 <211> 129  
 <212> DNA  
 <213> Centruroides noxius

<220>  
 <221> CDS  
 <222> (1)..(129)  
 <223> Product= Erg channel modifier toxin

<400> 235  
 gat aga gat agc tgt gtt gat aaa tca caa tgc gga aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Gly Lys Tyr Gly Tyr  
 1                  5                  10                  15

tac ggt caa tgt gat gag tgt tgc aag aaa gct gga gaa cgt gta gga 96  
 Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Glu Arg Val Gly  
                   20                  25                  30

acc tgc gtg tat tac aag tgt aaa tgt aac cca 129  
 Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
           35                  40

<210> 236  
 <211> 43  
 <212> PRT  
 <213> Centruroides noxius

<400> 236  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Gly Lys Tyr Gly Tyr  
 1                  5                  10                  15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Glu Arg Val Gly  
                   20                  25                  30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
           35                  40

<210> 237  
 <211> 212  
 <212> DNA  
 <213> Centruroides noxius

<220>  
 <221> CDS  
 <222> (1)..(132)  
 <223> Product= Erg channel modifier toxin precursor

<220>  
 <221> 3'UTR  
 <222> (133)..(212)  
 <223> 3'UTR

<400> 237  
 gat aga gat agc tgt gtt gat aaa tca aaa tgc gga aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr  
 1 5 10 15  
 tac caa gag tgt cag gat tgt tgc aag aat gct gga cac aat gga gga 96  
 Tyr Gln Glu Cys Gln Asp Cys Cys Lys Asn Ala Gly His Asn Gly Gly  
 20 25 30  
 acc tgc gtg tat tac aag tgt aaa tgt aac cca taa actcgaatgt 142  
 Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
 35 40  
 gaattaagaa tatcaaagct ggaagctgtt taagaagtga aaaataaaga ttattaaatt 202  
 tccgcaaatt 212

<210> 238  
 <211> 43  
 <212> PRT  
 <213> Centruroides noxius

<400> 238  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr  
 1 5 10 15  
 Tyr Gln Glu Cys Gln Asp Cys Cys Lys Asn Ala Gly His Asn Gly Gly  
 20 25 30  
 Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
 35 40

<210> 239  
 <211> 129  
 <212> DNA  
 <213> Centruroides noxius

<220>  
 <221> CDS  
 <222> (1)..(129)  
 <223> Product= Erg channel modifier toxin

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<400> 239
gat aga gat agc tgt gtt gat aaa tca aaa tgc gga aaa tat gga tac      48
Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
1          5          10          15

tac caa gag tgt cag gat tgt tgc aag aat gct gga cac aat gga gga      96
Tyr Gln Glu Cys Gln Asp Cys Cys Lys Asn Ala Gly His Asn Gly Gly
          20          25          30

acc tgc gtg tat tac aag tgt aaa tgt aac cca      129
Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
          35          40

<210> 240
<211> 43
<212> PRT
<213> Centruroides noxius

<400> 240

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
1          5          10          15

Tyr Gln Glu Cys Gln Asp Cys Cys Lys Asn Ala Gly His Asn Gly Gly
          20          25          30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
          35          40

<210> 241
<211> 194
<212> DNA
<213> Centruroides elegans

<220>
<221> CDS
<222> (1)..(129)
<223> Product= Erg channel modifier toxin precursor

<220>
<221> 3'UTR
<222> (130)..(194)
<223> 3'UTR

<400> 241
gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac      48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1          5          10          15

tac caa gag tgt aca gat tgt tgc aag aaa tat gga cac aat ggg gga      96
Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly
          20          25          30

acc tgc atg ttt ttc aag tgt aaa tgt gcg taa actcgaagat aaattaataa      149

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Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
 35 40

tatcaaagct gtaagctatt tatgaagtga aaaataaaga ttatg

194

<210> 242  
 <211> 42  
 <212> PRT  
 <213> Centruroides elegans

<400> 242

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15

Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly  
 20 25 30

Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
 35 40

<210> 243  
 <211> 126  
 <212> DNA  
 <213> Centruroides elegans

<220>  
 <221> CDS  
 <222> (1)..(126)  
 <223> Product= Erg channel modifier toxin

<400> 243  
 gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15

tac caa gag tgt aca gat tgt tgc aag aaa tat gga cac aat ggg gga 96  
 Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly  
 20 25 30

acc tgc atg ttt ttc aag tgt aaa tgt gcg 126  
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
 35 40

<210> 244  
 <211> 42  
 <212> PRT  
 <213> Centruroides elegans

<400> 244

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15



Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly  
20 25 30

Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
35 40

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<210> 245
<211> 197
<212> DNA
<213> Centruroides elegans
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<220>
<221> CDS
<222> (1)..(132)
<223> Product= Erg channel modifier toxin precursor
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<220>
<221> 3'UTR
<222> (133) .. (197)
<223> 3'UTR
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<400> 245  
gat aga gat agc tgt gtt gat aaa tca aga tgc gca aaa tat gga tac 48  
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr  
1 5 10 15

tac	caa	cag	tgt	gaa	att	tgt	tgc	aag	aaa	gct	gga	cac	aga	gga	gga	96
Tyr	Gln	Gln	Cys	Glu	Ile	Cys	Cys	Lys	Lys	Ala	Gly	His	Arg	Gly	Gly	
			20					25					30			

acc tgc gaa ttt ttc aag tgt aaa tgt aaa gta taa actcgaatgt 142  
Thr Cys Glu Phe Phe Lys Cys Lys Cys Lys Val  
35 40

qaattaagaa tatcaaagct gggaactggt tacgatgtga aaaataaaga ttatt 197

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<210> 246
<211> 43
<212> PRT
<213> Centruroides elegans
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<400> 246

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr  
1 5 10 15

Tyr Gln Gln Cys Glu Ile Cys Cys Lys Lys Ala Gly His Arg Gly Gly  
20 25 30

Thr Cys Glu Phe Phe Lys Cys Lys Cys Lys Val  
35 40

<210> 247  
 <211> 129  
 <212> DNA  
 <213> *Centruroides elegans*  
 <220>  
 <221> CDS  
 <222> (1)..(129)  
 <223> Product= Erg channel modifier toxin

<400> 247  
 gat aga gat agc tgt gtt gat aaa tca aga tgc gca aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15  
 tac caa cag tgt gaa att tgt tgc aag aaa gct gga cac aga gga gga 96  
 Tyr Gln Gln Cys Glu Ile Cys Cys Lys Lys Ala Gly His Arg Gly Gly  
 20 25 30  
 acc tgc gaa ttt ttc aag tgt aaa tgt aaa gta 129  
 Thr Cys Glu Phe Phe Lys Cys Lys Cys Lys Val  
 35 40

<210> 248  
 <211> 43  
 <212> PRT  
 <213> *Centruroides elegans*

<400> 248  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15  
 Tyr Gln Gln Cys Glu Ile Cys Cys Lys Lys Ala Gly His Arg Gly Gly  
 20 25 30  
 Thr Cys Glu Phe Phe Lys Cys Lys Cys Lys Val  
 35 40

<210> 249  
 <211> 196  
 <212> DNA  
 <213> *Centruroides elegans*  
 <220>  
 <221> CDS  
 <222> (1)..(132)  
 <223> Product= Erg channel modifier toxin precursor

<220>  
 <221> 3'UTR

&lt;222&gt; (133)..(196)

&lt;223&gt; 3'UTR

&lt;400&gt; 249

gat	aga	gat	agc	tgt	gtt	gat	aaa	tca	aaa	tgc	gga	aaa	tat	gga	tac	48
Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Lys	Cys	Gly	Lys	Tyr	Gly	Tyr	
1				5					10					15		

tat	cat	caa	tgt	gat	gag	tgt	tgc	aag	aaa	gct	gga	gac	cgt	gca	gga	96
Tyr	His	Gln	Cys	Asp	Glu	Cys	Cys	Lys	Lys	Ala	Gly	Asp	Arg	Ala	Gly	
			20					25					30			

aac	tgc	gtg	tat	tac	aag	tgt	aaa	tgt	aac	cca	taa	actcgaatgt	142
Asn	Cys	Val	Tyr	Tyr	Lys	Cys	Lys	Cys	Asn	Pro			
		35					40						

gaattaagaa	tatgaaagat	ggaagctgtt	taagaagtga	aaaataaaga	ttat	196
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&lt;210&gt; 250

&lt;211&gt; 43

&lt;212&gt; PRT

&lt;213&gt; Centruroides elegans

&lt;400&gt; 250

Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Lys	Cys	Gly	Lys	Tyr	Gly	Tyr
1				5					10					15	

Tyr	His	Gln	Cys	Asp	Glu	Cys	Cys	Lys	Lys	Ala	Gly	Asp	Arg	Ala	Gly
			20					25					30		

Asn	Cys	Val	Tyr	Tyr	Lys	Cys	Lys	Cys	Asn	Pro
		35					40			

&lt;210&gt; 251

&lt;211&gt; 129

&lt;212&gt; DNA

&lt;213&gt; Centruroides elegans

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(129)

&lt;223&gt; Product= Erg channel modifier toxin

&lt;400&gt; 251

gat	aga	gat	agc	tgt	gtt	gat	aaa	tca	aaa	tgc	gga	aaa	tat	gga	tac	48
Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Lys	Cys	Gly	Lys	Tyr	Gly	Tyr	
1				5					10					15		

tat	cat	caa	tgt	gat	gag	tgt	tgc	aag	aaa	gct	gga	gac	cgt	gca	gga	96
Tyr	His	Gln	Cys	Asp	Glu	Cys	Cys	Lys	Lys	Ala	Gly	Asp	Arg	Ala	Gly	
			20					25					30			

aac	tgc	gtg	tat	tac	aag	tgt	aaa	tgt	aac	cca	129
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

Asn Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
 35 40

<210> 252  
 <211> 43  
 <212> PRT  
 <213> *Centruroides elegans*

<400> 252

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr  
 1 5 10 15

Tyr His Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30

Asn Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
 35 40

<210> 253  
 <211> 193  
 <212> DNA  
 <213> *Centruroides gracilis*

<220>  
 <221> CDS  
 <222> (1)..(129)  
 <223> Product= Erg channel modifier toxin precursor

<220>  
 <221> 3'UTR  
 <222> (130)..(193)  
 <223> 3'UTR

<400> 253  
 gat aga gat agc tgt gtt gat aaa tca cga tgc gcg aaa tat gga cac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly His  
 1 5 10 15

tac caa gag tgt acg gat tgt tgc aag aaa tac gga cac aat gga gga 96  
 Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly  
 20 25 30

acc tgc atg ttc ttc aag tgt aaa tgt gcg taa actcgaagat gaattaataa 149  
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
 35 40

tataaaagct gtaagctatt tacgaagtga aaaataaaga ttat 193

<210> 254  
 <211> 42  
 <212> PRT  
 <213> *Centruroides gracilis*

&lt;400&gt; 254

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly His  
 1 5 10 15

Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly  
 20 25 30

Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
 35 40

&lt;210&gt; 255

&lt;211&gt; 126

&lt;212&gt; DNA

<213> *Centruroides gracilis*

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(126)

&lt;223&gt; Product= Erg channel modifier toxin

&lt;400&gt; 255

gat aga gat agc tgt gtt gat aaa tca cga tgc gcg aaa tat gga cac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly His  
 1 5 10 15

tac caa gag tgt acg gat tgt tgc aag aaa tac gga cac aat gga gga 96  
 Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly  
 20 25 30

acc tgc atg ttc ttc aag tgt aaa tgt gcg 126  
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
 35 40

&lt;210&gt; 256

&lt;211&gt; 42

&lt;212&gt; PRT

<213> *Centruroides gracilis*

&lt;400&gt; 256

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly His  
 1 5 10 15

Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly  
 20 25 30

Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
 35 40

<210> 257  
 <211> 193  
 <212> DNA  
 <213> *Centruroides gracilis*  
  
 <220>  
 <221> CDS  
 <222> (1)..(129)  
 <223> Product= Erg channel modifier toxin precursor

<220>  
 <221> 3'UTR  
 <222> (130)..(193)  
 <223> 3'UTR

<400> 257  
 gat aga gat agc tgt gtt gat aaa tca cga tgc caa aaa tat gga aac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Asn  
 1 5 10 15  
  
 tac gct cag tgt acg gcc tgt tgc aag aag gct gga cac aat aaa gga 96  
 Tyr Ala Gln Cys Thr Ala Cys Cys Lys Lys Ala Gly His Asn Lys Gly  
 20 25 30  
  
 acc tgc gac ttt ttc aag tgt aaa tgt acg taa tctcgaagaa gaattaatta 149  
 Thr Cys Asp Phe Phe Lys Cys Lys Cys Thr  
 35 40  
  
 tatcaaagct tggaaccaat taccgaagtg gaaaaattaa gaat 193

<210> 258  
 <211> 42  
 <212> PRT  
 <213> *Centruroides gracilis*

<400> 258  
  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Asn  
 1 5 10 15  
  
 Tyr Ala Gln Cys Thr Ala Cys Cys Lys Lys Ala Gly His Asn Lys Gly  
 20 25 30  
  
 Thr Cys Asp Phe Phe Lys Cys Lys Cys Thr  
 35 40

<210> 259  
 <211> 126  
 <212> DNA  
 <213> *Centruroides gracilis*

<220>  
 <221> CDS  
 <222> (1)..(126)

<223> Product= Erg channel modifier toxin

<400> 259

```
gat aga gat agc tgt gtt gat aaa tca cga tgc caa aaa tat gga aac      48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Asn
1           5           10           15
```

```
tac gct cag tgt acg gcc tgt tgc aag aag gct gga cac aat aaa gga      96
Tyr Ala Gln Cys Thr Ala Cys Cys Lys Lys Ala Gly His Asn Lys Gly
                20           25           30
```

```
acc tgc gac ttt ttc aag tgt aaa tgt acg      126
Thr Cys Asp Phe Phe Lys Cys Lys Cys Thr
                35           40
```

<210> 260

<211> 42

<212> PRT

<213> *Centruroides gracilis*

<400> 260

```
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Asn
1           5           10           15
```

```
Tyr Ala Gln Cys Thr Ala Cys Cys Lys Lys Ala Gly His Asn Lys Gly
                20           25           30
```

```
Thr Cys Asp Phe Phe Lys Cys Lys Cys Thr
                35           40
```

<210> 261

<211> 197

<212> DNA

<213> *Centruroides gracilis*

<220>

<221> CDS

<222> (1)..(141)

<223> Product= Erg channel modifier toxin precursor

In the mature peptide, the last Ser is amidated, and the last Gly  
and the last basic aminoacid are cut

<220>

<221> 3'UTR

<222> (142)..(197)

<223> 3'UTR

<400> 261

```
gat aga gat agc tgt gtt gat aaa tca cga tgc caa aaa tat gga ccc      48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Pro
1           5           10           15
```

tac gga cag tgt acg gac tgt tgc aag aaa gct gga cac act gga gga 96  
 Tyr Gly Gln Cys Thr Asp Cys Cys Lys Lys Ala Gly His Thr Gly Gly  
                   20                                  25                                  30

acc tgc ata tat ttc aag tgt aaa tgt ggc gca gaa agt gga aga 141  
 Thr Cys Ile Tyr Phe Lys Cys Lys Cys Gly Ala Glu Ser Gly Arg  
                   35                                  40                                  45

tgaatttata atatcaaagc tgtaagctat ttacgaagtg aaaaataaag attatt 197

<210> 262  
 <211> 47  
 <212> PRT  
 <213> Centruroides gracilis

<400> 262

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Pro  
 1                                  5                                  10                                  15

Tyr Gly Gln Cys Thr Asp Cys Cys Lys Lys Ala Gly His Thr Gly Gly  
                   20                                  25                                  30

Thr Cys Ile Tyr Phe Lys Cys Lys Cys Gly Ala Glu Ser Gly Arg  
                   35                                  40                                  45

<210> 263  
 <211> 135  
 <212> DNA  
 <213> Centruroides gracilis

<220>  
 <221> CDS  
 <222> (1)..(135)  
 <223> Product= Erg channel modifier toxin

<400> 263  
 gat aga gat agc tgt gtt gat aaa tca cga tgc caa aaa tat gga ccc 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Pro  
 1                                  5                                  10                                  15

tac gga cag tgt acg gac tgt tgc aag aaa gct gga cac act gga gga 96  
 Tyr Gly Gln Cys Thr Asp Cys Cys Lys Lys Ala Gly His Thr Gly Gly  
                   20                                  25                                  30

acc tgc ata tat ttc aag tgt aaa tgt ggc gca gaa agt 135  
 Thr Cys Ile Tyr Phe Lys Cys Lys Cys Gly Ala Glu Ser  
                   35                                  40                                  45

<210> 264  
 <211> 45  
 <212> PRT  
 <213> Centruroides gracilis



&lt;400&gt; 264

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Pro  
 1 5 10 15

Tyr Gly Gln Cys Thr Asp Cys Cys Lys Lys Ala Gly His Thr Gly Gly  
 20 25 30

Thr Cys Ile Tyr Phe Lys Cys Lys Cys Gly Ala Glu Ser  
 35 40 45

&lt;210&gt; 265

&lt;211&gt; 194

&lt;212&gt; DNA

<213> *Centruroides sculpturatus*

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(129)

&lt;223&gt; Product= Erg channel modifier toxin precursor

&lt;220&gt;

&lt;221&gt; 3'UTR

&lt;222&gt; (130)..(194)

&lt;223&gt; 3'UTR

&lt;400&gt; 265

gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15

tac caa gag tgt cag gat tgt tgc aag aaa gct gga cat aat gga gga 96  
 Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly  
 20 25 30

acc tgt atg ttt ttc aag tgt aaa tgt gcg taa actcgaagat gaattaataa 149  
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
 35 40

tatcaaagct gtaagctatt tatgaagtga aaaataaaga ttatt 194

&lt;210&gt; 266

&lt;211&gt; 42

&lt;212&gt; PRT

<213> *Centruroides sculpturatus*

&lt;400&gt; 266

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15

Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly

20

25

30

Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
           35                          40

&lt;210&gt; 267

&lt;211&gt; 126

&lt;212&gt; DNA

<213> *Centruroides sculpturatus*

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(126)

&lt;223&gt; Product= Erg channel modifier toxin

&lt;400&gt; 267

gat	aga	gat	agc	tgt	gtt	gat	aaa	tca	cga	tgc	gca	aaa	tat	gga	tac	48
Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Arg	Cys	Ala	Lys	Tyr	Gly	Tyr	
1				5				10					15			

tac	caa	gag	tgt	cag	gat	tgt	tgc	aag	aaa	gct	gga	cat	aat	gga	gga	96
Tyr	Gln	Glu	Cys	Gln	Asp	Cys	Cys	Lys	Lys	Ala	Gly	His	Asn	Gly	Gly	
			20					25					30			

acc	tgt	atg	ttt	ttc	aag	tgt	aaa	tgt	gcg							126
Thr	Cys	Met	Phe	Phe	Lys	Cys	Lys	Cys	Ala							
		35					40									

&lt;210&gt; 268

&lt;211&gt; 42

&lt;212&gt; PRT

<213> *Centruroides sculpturatus*

&lt;400&gt; 268

Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Arg	Cys	Ala	Lys	Tyr	Gly	Tyr
1				5				10					15		

Tyr	Gln	Glu	Cys	Gln	Asp	Cys	Cys	Lys	Lys	Ala	Gly	His	Asn	Gly	Gly
			20					25					30		

Thr Cys Met Phe Phe Lys Cys Lys Cys Ala  
           35                          40

&lt;210&gt; 269

&lt;211&gt; 197

&lt;212&gt; DNA

<213> *Centruroides sculpturatus*

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(132)

<223> precursorProduct= Erg channel modifier toxin

<220>

<221> 3'UTR

<222> (133)..(197)

<223> 3'UTR

<400> 269

gat	aga	gat	agc	tgt	gtt	gat	aaa	tca	cga	tgc	gca	aaa	tat	gga	tac	48
Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Arg	Cys	Ala	Lys	Tyr	Gly	Tyr	
1				5					10					15		

tac	ggt	caa	tgt	gaa	gtt	tgt	tgt	aag	aaa	gct	gga	cat	aga	gga	gga	96
Tyr	Gly	Gln	Cys	Glu	Val	Cys	Cys	Lys	Lys	Ala	Gly	His	Arg	Gly	Gly	
			20					25				30				

acc	tgc	gat	ttt	ttc	aag	tgt	aaa	tgt	aaa	gta	taa	actcgaatgt	142
Thr	Cys	Asp	Phe	Phe	Lys	Cys	Lys	Cys	Lys	Val			
		35					40						

gaattaagaa	tatcaaagct	gggaactggt	tacgaagtga	aaaataaaga	ttttg	197
------------	------------	------------	------------	------------	-------	-----

<210> 270

<211> 43

<212> PRT

<213> Centruroides sculpturatus

<400> 270

Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Arg	Cys	Ala	Lys	Tyr	Gly	Tyr
1				5					10					15	

Tyr	Gly	Gln	Cys	Glu	Val	Cys	Cys	Lys	Lys	Ala	Gly	His	Arg	Gly	Gly
			20					25				30			

Thr	Cys	Asp	Phe	Phe	Lys	Cys	Lys	Cys	Lys	Val
		35				40				

<210> 271

<211> 129

<212> DNA

<213> Centruroides sculpturatus

<220>

<221> CDS

<222> (1)..(129)

<223> Product= Erg channel modifier toxin

<400> 271

gat	aga	gat	agc	tgt	gtt	gat	aaa	tca	cga	tgc	gca	aaa	tat	gga	tac	48
Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Arg	Cys	Ala	Lys	Tyr	Gly	Tyr	
1				5					10					15		

tac ggt caa tgt gaa gtt tgt tgt aag aaa gct gga cat aga gga gga 96  
 Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Arg Gly Gly  
                   20                  25                  30

acc tgc gat ttt ttc aag tgt aaa tgt aaa gta 129  
 Thr Cys Asp Phe Phe Lys Cys Lys Cys Lys Val  
           35                  40

<210> 272  
 <211> 43  
 <212> PRT  
 <213> Centruroides sculpturatus

<400> 272

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr  
 1                  5                  10                  15

Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Arg Gly Gly  
                   20                  25                  30

Thr Cys Asp Phe Phe Lys Cys Lys Cys Lys Val  
           35                  40

<210> 273  
 <211> 197  
 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
 <221> CDS  
 <222> (1)..(132)  
 <223> Product= Erg channel modifier toxin precursor

<220>  
 <221> 3'UTR  
 <222> (133)..(197)  
 <223> 3'UTR

<400> 273  
 gat aga gat agc tgt gtt gat aaa tca cga tgc gga aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gly Lys Tyr Gly Tyr  
 1                  5                  10                  15

tac ggt caa tgt gat gac tgt tgc aag aaa gct gga gac cgt gca gga 96  
 Tyr Gly Gln Cys Asp Asp Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
                   20                  25                  30

acc tgc gtg tat tac aag tgt aaa tgt aac cca taa actcgaatgt 142  
 Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
           35                  40

gaattaagaa tatcaaagct ggaagctgtt taagaagtga aaaataaaga ttatt 197

<210> 274  
 <211> 43  
 <212> PRT  
 <213> Centruroides sculpturatus

<400> 274

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gly Lys Tyr Gly Tyr  
 1 5 10 15

Tyr Gly Gln Cys Asp Asp Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
 35 40

<210> 275  
 <211> 129  
 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
 <221> CDS  
 <222> (1)..(129)  
 <223> Product= Erg channel modifier toxin

<400> 275  
 gat aga gat agc tgt gtt gat aaa tca cga tgc gga aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gly Lys Tyr Gly Tyr  
 1 5 10 15  
 tac ggt caa tgt gat gac tgt tgc aag aaa gct gga gac cgt gca gga 96  
 Tyr Gly Gln Cys Asp Asp Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30  
 acc tgc gtg tat tac aag tgt aaa tgt aac cca 129  
 Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
 35 40

<210> 276  
 <211> 43  
 <212> PRT  
 <213> Centruroides sculpturatus

<400> 276

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gly Lys Tyr Gly Tyr  
 1 5 10 15

Tyr Gly Gln Cys Asp Asp Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
 35 40

<210> 277  
 <211> 195  
 <212> DNA  
 <213> Centruroides sculpturatus

<220>  
 <221> CDS  
 <222> (1)..(132)  
 <223> Product= Erg channel modifier toxin precursor

<220>  
 <221> 3'UTR  
 <222> (133)..(195)  
 <223> 3'UTR

<400> 277  
 gat aga gat agc tgt gtt gat aaa tca cga tgc gga aaa tat gga tac 48  
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gly Lys Tyr Gly Tyr  
 1 5 10 15

tac ggt caa tgt gat gaa tgt tgc aag aaa gct gga gac cgt gca gga 96  
 Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30

acc tgc gtg tat tac aag tgt aaa tgt aac cca taa actcgaatgt 142  
 Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
 35 40

gaattaagaa tatcaaagct ggaagctgtt taagaagtga aaaataaaga tta 195

<210> 278  
 <211> 43  
 <212> PRT  
 <213> Centruroides sculpturatus

<400> 278

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gly Lys Tyr Gly Tyr  
 1 5 10 15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly  
 20 25 30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro  
 35 40

<210> 279  
 <211> 129  
 <212> DNA

<213> Centruroides sculpturatus

<220>

<221> CDS

<222> (1)..(129)

<223> Product= Erg channel modifier toxin

<400> 279

gat	aga	gat	agc	tgt	gtt	gat	aaa	tca	cga	tgc	gga	aaa	tat	gga	tac	48
Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Arg	Cys	Gly	Lys	Tyr	Gly	Tyr	
1				5					10					15		

tac	ggt	caa	tgt	gat	gaa	tgt	tgc	aag	aaa	gct	gga	gac	cgt	gca	gga	96
Tyr	Gly	Gln	Cys	Asp	Glu	Cys	Cys	Lys	Lys	Ala	Gly	Asp	Arg	Ala	Gly	
			20					25					30			

acc	tgc	gtg	tat	tac	aag	tgt	aaa	tgt	aac	cca						129
Thr	Cys	Val	Tyr	Tyr	Lys	Cys	Lys	Cys	Asn	Pro						
		35					40									

<210> 280

<211> 43

<212> PRT

<213> Centruroides sculpturatus

<400> 280

Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Arg	Cys	Gly	Lys	Tyr	Gly	Tyr
1				5					10					15	

Tyr	Gly	Gln	Cys	Asp	Glu	Cys	Cys	Lys	Lys	Ala	Gly	Asp	Arg	Ala	Gly
			20					25					30		

Thr	Cys	Val	Tyr	Tyr	Lys	Cys	Lys	Cys	Asn	Pro
		35					40			

<210> 281

<211> 192

<212> DNA

<213> Centruroides sculpturatus

<220>

<221> CDS

<222> (1)..(144)

<223> Product= Erg channel modifier toxin precursor

<220>

<221> 3'UTR

<222> (145)..(192)

<223> 3'UTR

<400> 281

gat	aga	gat	agc	tgt	gtt	gat	aaa	tca	cga	tgc	gca	aaa	tat	gga	tac	48
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----

```

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1          5          10          15
tac ggt caa tgt gaa gtt tgt tgt aag aaa gct gga cat aat gga gga      96
Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Asn Gly Gly
          20          25          30
acc tgt atg ttt ttc aag tgt atg tgc gta aac tcg aag atg aat taa      144
Thr Cys Met Phe Phe Lys Cys Met Cys Val Asn Ser Lys Met Asn
          35          40          45
taatatcaaa gctgtaagct atttatgaag tgaaaaataa agattatt      192

```

```

<210> 282
<211> 47
<212> PRT
<213> Centruroides sculpturatus

```

```

<400> 282

```

```

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1          5          10          15
Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Asn Gly Gly
          20          25          30
Thr Cys Met Phe Phe Lys Cys Met Cys Val Asn Ser Lys Met Asn
          35          40          45

```

```

<210> 283
<211> 141
<212> DNA
<213> Centruroides sculpturatus

```

```

<220>
<221> CDS
<222> (1)..(141)
<223> Product= Erg channel modifier toxin

```

```

<400> 283
gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac      48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1          5          10          15
tac ggt caa tgt gaa gtt tgt tgt aag aaa gct gga cat aat gga gga      96
Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Asn Gly Gly
          20          25          30
acc tgt atg ttt ttc aag tgt atg tgc gta aac tcg aag atg aat      141
Thr Cys Met Phe Phe Lys Cys Met Cys Val Asn Ser Lys Met Asn
          35          40          45

```

```

<210> 284

```



<211> 47  
 <212> PRT  
 <213> Centruroides sculpturatus

<400> 284

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr  
 1 5 10 15

Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Asn Gly Gly  
 20 25 30

Thr Cys Met Phe Phe Lys Cys Met Cys Val Asn Ser Lys Met Asn  
 35 40 45

<210> 285  
 <211> 24  
 <212> DNA  
 <213> Artificial

<220>  
 <223> PCR Reverse oligonucleotide primer

<220>  
 <221> misc\_feature  
 <222> (23)..(23)  
 <223> n is a, t, g, or c

<220>  
 <221> primer\_bind  
 <222> (1)..(24)  
 <223> oligonucleotide T22NN

<220>  
 <221> misc\_feature  
 <222> (24)..(24)  
 <223> n is a, t, g, or c

<400> 285  
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24

<210> 286  
 <211> 25  
 <212> DNA  
 <213> Artificial

<220>  
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<220>  
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<223> y is c or t

<220>

<221> primer\_bind

<222> (1)..(25)

<223> Oligonucleotide D1

<400> 286

gagatgaatt cgttggtgat gatya

25

<210> 287

<211> 22

<212> DNA

<213> Artificial

<220>

<223> PCR Reverse oligonucleotide primer

<400> 287

gcaattaaga agcgttaca ta

22

<210> 288

<211> 16

<212> DNA

<213> Artificial

<220>

<223> PCR Direct oligonucleotide primer

<220>

<221> misc\_feature

<222> (2)..(2)

<223> m is a or c

<220>

<221> primer\_bind

<222> (1)..(16)

<223> Direct oligonucleotide CexD2

<220>

<221> misc\_feature

<222> (5)..(5)

<223> r is a or g

<220>

<221> misc\_feature

<222> (9)..(9)

<223> r is a or g

<400> 288

gmaarggarg gttatc

16

<210> 289  
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<220>  
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 <223> r is a or g

<220>  
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 <223> b is c or g

<220>  
 <221> misc\_feature  
 <222> (7)..(7)  
 <223> s is c or g

<400> 289  
 raaggasggt tatccb

16

<210> 290  
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 <212> DNA  
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<220>  
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<220>  
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<220>  
 <221> misc\_feature  
 <222> (2)..(2)  
 <223> m is a or c

<220>

<221> misc\_feature  
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 <223> m is a or c

<400> 290  
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17

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<220>  
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 <222> (16)..(16)  
 <223> m is a or c

<220>  
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 <222> (17)..(17)  
 <223> m is a or c

<400> 291  
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17

<210> 292  
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<220>  
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<220>  
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<400> 292  
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27

<210> 293  
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<212> DNA  
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<220>  
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<220>  
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<400> 293  
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24

<210> 294  
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<212> DNA  
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<220>  
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<222> (1)..(24)  
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<400> 294  
ttagctgcaa gatttattag gaag

24